AUTHOR INDEX

(Names appearing in capital letters indicate authors of chapters in this volume.)

A

Aannestad, P. A., 505
Aarseth, S. J., 193
Ables, H., 365
Achterberg, A., 257
Adachi, I., 98, 108
Adams, N. G., 280
Adams, P. J., 472
Adams, T. F., 22, 25
Adgie, R. L., 168, 169
Aggarwal, H. R., 105
Ahern, F. J., 284
Ahlen, S. P., 426
Aitken, D. K., 49, 283
Aizu, E., 310
Ake, T. B., 264
Alcock, C., 271, 374, 385, 387, 389, 390
Alexander, D. R., 278
Alfvén, H., 80, 104, 106
Allan, H. R., 299
Allègre, C. J., 79
Allen, C. W., 312, 376
Allen, L. R., 138, 145, 153, 169
Allen, R. J., 313
Aller, H. D., 326, 333, 336, 339, 340
Alloin, D., 421, 432
Alpher, R. A., 489
Altenhoff, W. J., 269, 503
Althouse, W. E., 422
Altschuler, D. R., 325, 327, 341, 342
Alvarez, L. W., 306
AMBARTSUMIAN, V. A., 1-13
Ammann, M., 129
Anderegg, M., 49
Andernach, H., 173, 180, 203
Anders, E., 79
Andersen, J., 134, 136, 137, 143, 160
Anderson, B., 168, 169
Anderson, C. M., 450
Anderson, D. L., 105
Andrew, B. H., 324, 340
Andrews, D. H., 134, 135
ANGEL, J. R. P., 321-61; 209, 234, 268, 275, 276, 322-24, 326, 333, 334, 336-39, 341, 344-46, 351, 352, 355, 379, 380, 382
Angione, R., 203
Anicich, V. G., 402
Annestad, P. A., 235, 245
Appenzeller, I., 346, 506
Arawal, P. C., 325
Arens, J. F., 306, 425
Argue, A. N., 172
Armstrong, K. R., 505
Arnett, W. D., 241, 383, 434
Arnold, C. N., 242
Arp, H., 332, 333
Arrhenius, G., 80, 106
Asbridge, J. R., 19, 228
Asséo, E., 303
Athay, R. G., 440, 441, 444, 445, 451, 452, 458, 462, 470, 472, 477, 481, 483
Audouze, J., 306, 427, 432
Auer, L. H., 367, 371, 372
Aumann, H. H., 49
Auriemma, C., 178
Auvergne, M., 446
Avedisova, V. S., 254
Avni, Y., 327, 346
Avrett, E. H., 440, 451-56, 477, 482
Axford, W. I., 169, 255, 300, 304
Axon, D. J., 322
Ayres, T. R., 442, 450, 452-54, 457, 461, 463-66, 477, 478, 481, 482

B

Baade, W., 16, 197, 332, 418
Baath, L., 194-96
Babadzhanyants, M. K., 323, 326, 331, 335, 344, 345
Babcock, H. W., 19
Badhwar, G. D., 303, 310, 311
Baggio, R., 189
Bahcall, J. N., 115
Bailey, J. A., 325
Baker, J. R., 173, 180, 203
Balasubrahmanyan, V. K., 306
Baldwin, B. J., 43, 66
Baldwin, J., 313
Baldwin, J. A., 324, 326, 327, 330, 331, 334, 342
Baldwin, J. E., 176, 198, 313, 327
Balick, B., 419
Baliunas, S. L., 450, 453-57, 475, 477-79, 482
Ball, J. A., 274, 276, 284
Balona, L. A., 16, 28, 34, 35
Baluteau, J. P., 49
Bame, S. J., 19, 228
Bappu, M. K. V., 462
Barber, D., 169
Bare, C. C., 168, 325, 327
Barkat, A., 271, 278, 280
Barker, E. S., 472
Barlow, D. J., 128
Barnes, J. V., 136, 156
Barnes, T. G., 116, 265, 266, 271, 368, 370, 374, 417, 450, 477
Barrel, S. L., 28, 29, 36
Barrell, J., 105
Barry, D. C., 119
Barshay, S. T., 55
Bartoe, J.-D. F., 445, 451, 452, 456, 471
Basri, G. S., 270, 442, 450-56, 459, 461, 466-69, 471-75, 477
Batchelor, R., 325, 327
Batten, A. H., 124, 126-31, 134, 136-40, 142-45, 156
Baud, B., 194-96
Beaver, E. A., 197, 203, 268, 275, 332, 344, 345, 352
Bechis, K. P., 265, 275, 282
Beck, R., 313
Beck, S. C., 250, 277
Becker, R. H., 479
Becker, S. A., 18, 20, 38
Beckers, J. M., 471, 472
Becklin, E. E., 250, 272, 275
Beckman, J. E., 49, 511, 543
Beckwith, S., 243, 250, 251, 258, 268, 273, 278, 280, 283
Beddoes, D. R., 144
Bednarczyk, S. M., 495
Beebe, H. A., 475
Beer, R., 49, 55, 266, 417
Behall, A. L., 148, 149, 151, 365
Beigman, I. L., 541
Bell, A. R., 229, 255, 256, 304
Bell, R. A., 121
Benedict, W. S., 498
Benford, G., 170
Bennett, K., 314, 315
Benson, J. M., 277
Benvenuti, P., 240, 241
Berezinsky, V., 316
Berezne, J., 49, 58
Berlin, A. B., 194
Bernat, A. P., 265, 266, 274, 275, 279, 474
Bernstein, D. N., 541
Bernstein, I. N., 541
Berriman, G., 273, 278, 280
Bertola, F., 209

Bessell, M. S., 364, 369, 371-73, 376, 377, 393
Betz, A. L., 265, 269, 271, 272, 274-76, 280
Bezzerides, B., 224
Bidelman, W. P., 446
Biermann, P., 313
Bieser, F. S., 422, 424, 425
Bigeleisen, P. E., 89
Bignami, G. F., 314, 315
Bijaoui, A., 446
Bingham, R. G., 322
Binnendijk, L., 115
Birck, J. L., 79
Bird, G R., 498, 517
Birkinshaw, M., 176, 181, 551, 554
Biskamp, D., 230
Black, D. C., 79
Black, J. H., 237, 241, 251, 252, 448, 450
Blackman, G. L., 252
Blackwell, D. E., 269, 421, 432
Blair, A. G., 508, 538
Blanco, C., 448, 450
Blanco, V. M., 81, 108, 203, 209
Blandford, R. D., 170, 187, 193, 195, 196, 200, 202, 204, 255, 291, 304, 307, 349-52
Blazit, A., 145
Bless, R. C., 116
Blitz, L., 252
Bloomer, R. H., 139
Blumenthal, G., 194
Bodenheimer, P., 79
Boesgaard, A. M., 270, 274
Boglin, A., 446
Bohm, H. U., 458
Böhm, K. H., 239, 243, 375, 377, 384, 386, 387, 391, 393
Böhm-Vitense, E., 367, 446-48, 450
Boksenberg, A., 209, 212, 333, 376, 386
Boldt, E. A., 190, 325, 327, 344, 350, 479
Bolton, J. G., 324, 325, 327
Bonneau, D., 145
Boone, R. L., 326, 331-33, 336, 338, 339, 346, 351, 355
Bopp, B. W., 476, 479, 481
Borken, R., 314
Boughn, S. P., 522-24
Bowers, P. F., 265, 269, 274-79, 282, 283
Bowyer, C. S., 477-79
Bowyer, S., 326, 367, 371
Boynton, P. E., 492-94
Bozkurt, S., 128
Bradt, H. V. D., 344, 371
Braes, L. L. E., 212
Brand, P. W. J. L., 243
Brandie, G. W., 208, 325
Branduardi, G., 327, 346, 447
Breakiron, L. A., 145
Brecher, K., 291, 386, 387
Bregman, J. D., 49, 58, 60, 66, 267
Bregman, J. N., 267
Brett, R. A., 335
Bridges, C. A., 471
Bridle, A. H., 176, 180, 185, 194, 195, 198, 202-5, 208, 210, 325, 327
Briel, U., 326, 327
Brindle, C., 307
Broadfoot, A. L., 240
Broderick, J. J., 325, 327
Broten, N. W., 168
Brown, A., 448-50, 457
Brown, D. R., 472
Brown, J. C., 452
Brown, R. H., 168
Brown, R. L., 243, 271
Brueckner, G., 445, 451, 452, 456, 471
Bruner, E. C. Jr., 462
Bruno, M. S., 329
Bubukin, S., 554
Buccheri, R., 314, 315
Budding, E., 127
Bues, I., 388
Buff, J., 225
Buffington, A., 306, 309-11
Bühler, F., 424
Bulanov, S. V., 313
Bunch, T. E., 43, 66
Burbidge, E. M., 203, 209, 324, 326, 327, 334, 342
Burbidge, G. R., 169, 193, 203, 209, 291, 324, 326, 348, 349, 386, 387
Burch, S. F., 172, 188-90, 192, 198, 202, 205
Burke, B. F., 277, 492, 493, 503
Burke, E. M., 139
Burke, J. R., 234
Burke, W. L., 520
Burns, J. A., 108
Burns, J. O., 198, 202, 204, 205, 210
Burroughs, W. J., 498, 517
Burton, W. B., 308, 408
Busko, I. C., 476
Bussoletti, E., 49
Butcher, H., 203, 209, 258
Butler, S. E., 236, 241, 457
Bychkov, K. V., 241
Byrd, G. G., 191
Bystedt, J., 172, 192, 198, 202

C

Cacciari, C., 441, 447, 459-61
Caderni, N., 530
Cahn, J. H., 268, 271, 280, 281, 283, 284, 382, 383
Caldwell, C. N., 156
Caldwell, J. H., 306
Callahan, P. S., 193
Cameron, A. G. W., 80, 82, 89
Cameron, M. J., 173
Cameron, R. C., 133
Campbell, B., 153
Campbell, M. F., 268
Cannon, R. D., 335
Cannon, W., 327
Capps, R. W., 326, 335, 339, 340, 345
Caraveo, P., 314
Carbon, D. F., 274, 275, 454
Carleton, N. P., 517
Carlson, E. R., 404, 405, 407
Carlson, R. W., 55
Carpenter, K. G., 446-48, 450
Carson, T. R., 18, 20, 375, 393
Carstensen, E., 130
Carswell, R. F., 324, 326
Carter, B., 16
Cartwright, B. G., 426
Cash, W. C., 367, 447, 477-79
Cassé, M., 307, 309, 314
Cassinelli, J. P., 278, 386, 447
Castor, J. I., 22, 25, 220, 221, 232
Catalano, S., 448, 450
Catlin, L. L., 508
Catura, R. C., 203
Caughlan, G. R., 427
Cavaliere, A., 554
Cayrel, R., 441
Cernicharo, J., 412
CESARSKY, C. J., 289-319; 293, 296-98, 303, 306, 307, 311, 314, 315
Cess, R. D., 56
Cester, B., 115, 122, 126-28, 130, 132, 136, 137, 139, 156
Chaiken, J., 105
Chaisson, L., 326, 327
Chambliss, C. R., 138
Chan, K. L., 543
Chandrasekhar, S., 94, 363
Chang, S. H., 442, 453-56, 461, 473
Chapman, C. R., 107
Chapman, E. A., 455
Charland, Y., 385
Charles, P., 326, 387, 447, 477-79
Chen, K.-Y., 128

Cheng, E. S., 522-24, 526, 528, 529
Chernyshev, V. I., 492, 493
Chevalier, R. A., 220, 221, 225, 229, 230, 232, 234, 241, 253, 254, 302, 419, 433
Chin, G., 251
Chin, Y., 294
Chipman, E. G., 451, 452, 456
Chisholm, R. M., 168
Chiu, G., 380
Chiu, H. Y., 442, 453-56, 461, 472, 473
Christiansen, W. A., 169, 195, 200
Christiansen, W. N., 172, 193
Christy, J., 365, 368
Christy, R. F., 15, 22, 25, 26
Chu, C. K., 222, 224
Chun, M. S., 421, 432
Chu. S.-I., 235, 249-51
Ciatti, F., 284
Cipolla, J. W., 231
Ciurla, T., 326, 335, 338
Clark, B. G., 168, 195, 325, 327
Clark, G. W., 314, 371
Clark, R. N., 66
Clark, T. A., 327, 353
Clarke, D., 276
Clarke, R. W., 168
Clary, W. G., 147
Clausen, J. V., 123, 126, 128, 130, 136, 137
Claussen, M. J., 277
Clayton, M. L., 281
Clayton, R. N., 435
Clegg, P. E., 511, 543
Clegg, R. E. S., 264, 265, 267
Cleghorn, T., 310
Clements, G. L., 119
Cochran, W. D., 251
Code, A. D., 116, 136, 139
Cogan, B. C., 15-18, 20, 21, 25, 28, 29, 34, 36
Cohen, J. G., 275, 277
Cohen, M. H., 166, 168, 172, 181, 195, 196, 202, 204, 267, 273, 325, 327, 334, 349
Colacevich, A., 145
Cole, D. J., 172, 173, 180, 209
Colgate, S. A., 350
Colla, G., 325, 327
Collins, C. B., 520
Collins, G. W., 19
Collin-Souffrin, S., 421, 432
Colvin, J. D., 350
Combes, M., 49, 51, 55-58, 60, 65
Comstock, G., 310
Condon, J. J., 325, 327, 341, 349
Conklin, E. K., 324, 338, 521-23
Connes, J., 48
Connes, P., 48, 147
Connolly, L. P., 418
Conrath, B., 49, 53
Consolmagno, G. J., 72
Conti, P. S., 138, 374, 447
Conttrell, P. L., 383
Conway, R. G., 167, 172, 197, 205, 325, 327, 335, 342
Cook, J. W., 457
Cooke, B. A., 185
Cooper, B. F. C., 172, 173, 180, 209, 325, 327
Cordova, F., 477
Corey, B. E., 522-24, 526, 528, 529
Corliss, C. H., 55
Cornett, R. H., 251
Coron, N., 49
Coroniti, F. V., 292
Costain, C. H., 185
Costero, R., 241
Cotton, W. D., 327, 328, 353
Cottrell, P. L., 376, 390
Couch, R. G., 434
Counselman, C. C., 327, 353
Cousins, A. W. J., 21, 37, 128, 136
Cowie, L. L., 178, 191, 225, 233, 234, 241, 250, 251
Cowley, A. P., 138
Cowsik, R., 290, 306, 311
COX, A. N., 15-41; 16-22, 25-29, 34-37, 378
Cox, D. P., 235, 237, 240, 257, 294, 304
Cox, J. P., 16, 19, 22, 25-27, 39
Cox, L. P., 92, 100, 102, 104
Coyne, G. V., 324, 339, 345
Crabtree, D. R., 272
Craine, E. R., 324, 326, 329, 330
Cram, L. E., 451, 452, 456, 461, 463, 466, 470-72
Crane, P., 193
Crane, P. C., 194
Crawford, D. L., 125, 136, 138, 156
Crawford, H. J., 424, 425
Cromwell, R. H., 119, 322
Crowne, A. H., 324, 326
Crowther, J. H., 168, 169
Cruikshank, D. P., 43, 49, 58, 61, 66, 72
Crutcher, R. M., 247, 251
Cudworth, K. M., 383
Culhane, J. L., 233, 234, 550
Cummings, A. C., 314, 422
Curtis, H. D., 197
Czarny, J., 447
Czyzak, S. J., 267

D

Dachs, J., 126
Dahn, C. C., 365, 368, 376, 393, 394
Dainty, J. C., 144
Dalgarno, A., 227, 245, 248, 249
Dall'oglio, G., 508
Daltabuit, E., 235, 257, 283, 506
D'Amico, N., 314, 315
Damle, S. V., 309
Danese, L., 489, 517, 538, 548, 554, 559
Daniel, R. R., 289, 310, 311
Danielson, R. E., 53
Dantel, M., 446
D'Antona, F., 388
Danziger, I. J., 324-26, 329, 330
Darland, J. J., 156
Das Gupta, M. K., 169
David, D. S., 51, 58, 60
Davidson, K., 282, 284, 350
Davidson, R. C., 230, 231
Davies, I. M., 325, 327
Davies, S. T., 312
Davis, C. G., 22, 25
Davis, J., 116, 138, 145, 153
Davis, L. E., 277, 283
Davis, M., 233
Davis, M. M., 180, 198, 204, 210, 325, 327
Davis, R., 446, 448, 450
Davis, R. J., 172, 327, 335, 342
Davis, W. D., 122
Davison, D. K., 25
Dawson, J. M., 231
Dean, J. F., 21, 37
Dearborn, D., 374, 427, 430
Dearborn, D. S. P., 382
de Bergh, C., 49, 51, 56, 58, 60
de Bruyn, A. G., 165, 194, 346
DeCampli, W. M., 82
de Jager, C., 450, 474
de Jong, T., 245, 249, 252
Dekkers, N. H., 66
de Loore, C., 447, 458
Delvaille, J., 203
Demarque, P., 79, 393
Dennison, B., 349
DeNoyer, L. K., 250
Dent, W. A., 169, 325, 327, 335
Dermott, S. F., 80
Desikachary, K., 455
Dettmann, T., 367, 446-48, 450

Deubner, F.-L., 458
Deupree, R. G., 18, 19, 21, 25, 27, 28, 35, 36
Deutsch, A. J., 277, 279
de Vaucouleurs, G., 203, 333
Devinney, E. J., 135, 139
De Young, D. S., 165, 169, 186, 190
DeZotti, G., 489, 517, 538, 548, 554, 559
Dibaj, E. A., 323, 345
Dickel, H. R., 251
Dickel, J. R., 251
Dickinson, D. F., 228, 265, 270, 274, 281, 325, 327, 342
Dietrich, W. F., 424
Dilworth, C., 311
Disney, M. J., 324
Dodds, D., 316
D'Odorico, S., 240, 241
Dogiel, V. A., 313
Doherty, L. R., 440
Dole, S. H., 92, 100
Dolgov, A., 548
Dombrovsky, V. A., 331, 335, 344, 345
Dominy, J. F., 143
Donahue, T. M., 109
Donaldson, W., 168, 169
Donnison, J. R., 82
Dopita, M. A., 234, 235, 239-43, 257
Doschek, G. A., 445, 457
Dower, R. G., 344
Downes, A., 189, 194, 198
Doxsey, R. E., 185, 325, 327, 344
Draine, B. T., 234, 240, 247
Dravins, D., 475
Drawin, H. W., 236
Dreher, J. W., 189, 192, 194, 195
Droge, F., 503
Dubrovich, V. K., 541
Duerr, R., 324, 326, 327
Dufour, R. J., 203, 209, 239, 241, 420
Dukes, R. J., 136
Dumont, P. J., 126-30, 136, 137, 139, 142
Dunn, R. B., 483
Dupree, A. K., 237, 241, 440, 446, 448, 450, 453-57, 475, 477-79
Durand, R. A., 18
Durrant, C. J., 472
Dwek, E., 267, 280
Dworetsky, M. M., 145
Dwyer, R., 425
Dyck, H. M., 324, 338, 447
Dziembowski, W., 19, 378

E

Eardley, D. M., 350, 351
Earl, J. A., 310
Eaton, J. A., 156, 476, 477
Eberhardt, P., 424
Eddington, A. S., 363
Eddy, J. A., 481
Edge, D. M., 316
Edgeworth, K. E., 83
Edmunds, M. G., 421, 432
Edwards, P. L., 321, 325, 327
Efimov, Y. S., 335
Egan, W. G., 267
Eggen, O. J., 129, 147, 149, 366
Eggleton, P. P., 143
Eichhorn, H., 147
Eichler, D., 187, 255-57
Eilek, J. A., 187
Ekers, J. A., 325, 327
Ekers, R. D., 166, 177, 178, 180, 181, 189, 190, 193-95, 324-26, 329, 330
Elgaroy, O., 168
Elias, J. H., 268
Elitzur, M., 245, 247-49, 252
Elliot, H., 312
Elliott, J. L., 351
Ellis, G. R. A., 504
Elmegreen, B. G., 228, 251, 252
Elmegreen, D. M., 251, 252
Elsmore, B., 325, 327
Elvis, M., 327, 346, 447
Elvius, A., 326, 345, 352
Emerson, D. T., 166, 313
Emslie, A. G., 452
Encrenaz, T., 49, 56-58, 60, 65
Encrenoz, P. J., 407, 411
Engels, D., 265, 276
Engvold, O., 463, 464, 466
Eoll, J. G., 18
Epstein, A., 229
Epstein, R. I., 428
Erickson, E. F., 43, 49, 53, 54, 58, 66
Erpenbeck, J. J., 253
Esepkina, N. A., 194
Espenak, F., 481
Etzel, P. B., 122
Evans, C. D., 471
Evans, D. S., 116, 143, 368, 374, 380, 450, 477
Evans, N. J. II, 251
Evans, N. R., 16, 34
Evans, R. G., 446, 457
Ewing, M. S., 195, 327, 492, 493

F

Fabbiano, G., 185, 229, 327, 346
Fabbri, R., 522, 523, 530, 555
Fabian, A. C., 203, 229, 276
Fabricant, D., 447, 448
Fachus, L. J., 325, 327
Falgarone, E., 294
Fanaroff, B. L., 169, 178
Fanti, C., 325, 327
Fanti, R., 178, 180, 189, 190, 194, 195, 325, 327
Faulkner, D. J., 17, 21, 27-29, 36
Feast, M. W., 137, 281
Fedel, B., 122, 126-28, 130, 132, 136, 137, 139
Feierberg, M. A., 72, 73
Feierman, B. H., 148
Feigelson, E., 203, 327, 346
Fekel, F. C., 143, 145
Feldman, P. A., 185
Feldman, U., 445, 457
Feldman, W. C., 19
Felenbok, P., 447
Feltz, K. A., 506
Fermi, E., 291, 292, 307
Fernie, J. D., 15, 17, 20
Ferrari, A., 187
Ficarra, A., 325, 327
Fichtel, C. E., 314, 316
Field, G. B., 235, 254, 543
Fink, U., 43, 44, 46, 49, 51, 55, 56, 58, 60-62, 64, 66, 68-70, 72, 73, 250
Finsen, W. S., 146-49, 152, 154
Fischel, D., 25
Fischer, P. C., 203
Fisher, A. J., 425
Fisher, W. A., 133, 139
Fisk, L. A., 255, 298
Fitch, W. S., 29
FitzGerald, M. P., 117, 284
Fitzgerald, P. M., 282, 284
Fix, J. D., 277, 278
Flasar, F. M., 193
Flasar, M., 49, 53
Fletcher, J. M., 124, 126-31, 134, 136-40, 142-45, 156
Flewelling, R. F., 292
Flower, P. J., 28, 36
Fogh Olson, H. J., 147
Fomalont, E. B., 167, 168, 171, 176, 180, 190, 194-96, 198, 202, 204, 205, 208, 210, 325, 327, 331, 342
Fontaine, G., 375, 385-89, 393
Fonti, S., 508
Foote, E. A., 295, 297
Forbes, J. E., 18
Ford, H. C., 258

Ford, W. K., 209
Formiggini, L., 325, 327
Forrest, W. J., 58, 60, 67
Forslund, D. W., 224
Forster, J. R., 188, 194, 195, 203
Fosbury, R. A. E., 239, 257, 324-26, 329, 330, 451, 463, 464
Fourcade, S., 79
Fowler, W. A., 427
Fowles, G. R., 253
Fox, K., 55
Fragola, J. L., 367
Fram, D. M., 522-24
Franz, O. G., 147
Fraquelli, D. A., 479
Fraser, C. W., 203
Frater, R. H., 172, 193
Frawley, W. M., 270
Frazier, E. N., 442, 460, 482
Freedman, I., 308
Freier, P. S., 306, 309, 310
Freire, R., 447
French, D. K., 307
French, H. B., 324, 326, 330, 336
Frerking, M. A., 407
Fricke, K., 21, 25, 26, 35
Fridman, A. M., 84
Frogel, J. A., 272, 275, 277
Fujii, M.., 310
Furenlid, I., 442, 453-56, 461, 463, 473
Furniss, I., 49
Fusi-Pecci, F., 280, 382

G

Gabriel, A. H., 483
Gallagher, J., 364
Galt, J. A., 168
Gamov, G., 537
Ganapathy, R., 79
Gandolfi, E., 325, 327
Garcia-Munoz, M., 309, 425
Gardner, C. S., 253
Gardner, F. F., 187, 188, 325, 327, 407, 409, 411, 503
Garmire, G. P., 233, 234, 314, 387, 477, 479
Garrard, T. L., 422
Garrison, R. F., 156
Gaskell, C. M., 237, 324, 325
Gatewood, C. V., 367
Gatewood, G., 145
Gatewood, G. D., 367
Gatley, I., 243, 268, 273, 278, 280, 283
Gautier, D., 49, 53
Gautier, T. N. III, 55, 66, 70, 250
Gavazzi, G., 176, 180
Gearhart, M. R., 324
Geballe, T. R., 49, 250, 266, 277, 417
Gebbie, H. A., 498, 517
Gebbie, K. B., 482
Gebel, W., 251
Gehrels, T., 80
Gehrz, R. D., 279
Geiss, J., 424
Geldzahler, B. J., 194, 325, 327
Geller, M. J., 329
Geller, R. B., 327, 353
Gent, H., 168, 169
Gerola, H., 252
Gershberg, R. E., 477
Getmantsev, G. G., 167, 298
Gezari, D. Y., 268, 505
Ghigo, F. D., 203
Giacconi, R., 203, 229, 327, 346, 368
Giampapa, M. S., 450
Giannone, P., 115
Giannuzzi, M. A., 115
Gibson, D. M., 208, 477, 479
Gierasch, P., 49, 53
Gilbert, G., 324, 326
Giler, M., 308, 311
Gillett, F. C., 48, 49, 58, 60, 67, 277
Gilliam, L. B., 471
Gilman, C., 310
Gilman, P. A., 481
Gilman, R. C., 267, 269
Gilmore, W., 265, 275, 278, 282, 283
Gilra, D. P., 265, 267, 273, 275, 278, 282, 283
Gimmestad, G. G., 498, 517
Ginzburg, V. L., 167, 289, 301, 311, 542
Gioia, I., 327
Gisler, G. R., 176, 191, 210
Giuli, R. T., 92
Giuliani, J. L., 254
Glackin, D. L., 450
Glebocki, R., 466
Gliese, W., 146, 148, 149, 152
Goeman, R. A., 311
Goirocom, G., 122, 126-28, 130, 132, 136, 137, 139
Goldberg, L., 275, 464
Golden, K. I., 231
Golden, R., 310
Golden, R. L., 310, 311
Goldreich, P., 84, 85, 89, 266, 274, 276, 280
Goldsmith, D. W., 251, 335
Goldsmith, P. F., 249, 404, 405, 407, 410, 413
Gol'nev, V. Ya., 194
Golson, J. C., 136, 156
Goody, R., 499, 501
Goorvitch, D., 49, 53, 54, 58
Gopal-Krishna, 189, 192, 194
Gora, E. K., 499
Gordon, H. A., 308
Gorenstein, M. V., 495, 522, 523, 527, 528
Gorenstein, P., 233, 447, 448
Goret, P., 309
Gosling, J. T., 19, 228
Goss, W. M., 172, 193, 209, 239, 252, 257, 324-26, 329, 330
Gottlieb, E. W., 327
Gough, D. O., 25, 461
Gould, R. J., 345, 548, 551
Gow, C. E., 272
Gower, J. F. R., 325, 327
Graham, D., 195, 327
Graham, J. A., 203, 209, 371
Grandi, S. A., 325, 327
Grasdalen, G. L., 78, 250, 324, 325, 334
Gray, D. F., 369, 455, 481
Green, J., 364
Green, R. F., 364, 371, 373, 379, 380, 383, 384, 391, 392, 394
Greenberg, R., 90, 91, 103, 104, 107
Greenebaum, M., 517
Greenstadt, E. W., 225, 229
Greenstein, J. L., 365-67, 369, 370, 373, 376-78, 383-87, 389, 390, 392
Greiner, D. E., 422, 424, 425
Greisen, E. W., 198, 202
Grenfell, T. C., 376, 388
Gresham, M., 366, 376, 393, 394
Griffiths, R. E., 325-27, 344
Grindlay, J. E., 185, 203, 447
Grønbech, B., 123, 126, 127, 130, 137
Gronenschild, E. H. B. M., 229, 233, 234
Gross, R. A., 222, 224
Grossman, L., 435
Grossmann-Doerth, U., 472
Grueff, G., 325, 327
Güdür, N., 128, 137
Guelin, M., 251, 407, 412, 431
Guetter, H., 365
Guidi, I., 522, 523
Guinan, E. F., 365
Guindon, B., 211
Gulkis, S., 325, 327, 342, 495
Gull, S. F., 551
Gull, T. R., 233, 244
Gülmen, O., 128
Gundermann, E. J., 166
Gunn, J. E., 542, 554

Gurevich, L. E., 83
Gursky, H., 185, 190
Gush, H. P., 517
Gustaffson, B., 121
Guthrie, B. N. G., 208
Gwinn, W. D., 252
Gyldenkerne, K., 126, 127, 129, 130

H

Haber, I., 230, 231
Hackney, K. R., 325, 331
Hackney, R. L., 325, 331
Haddock, F. T., 169
Hagen, F. A., 425
Hagen, W., 270, 273, 274, 278, 279, 474
Hagen-Thorn, V. A., 323, 326, 331, 335, 344, 345
Haisch, B. M., 269, 270, 445-48, 450, 457, 473-75, 477
Halbig, M., 228
Hall, D. N. B., 265, 266, 269, 271, 274, 275, 454
Hall, D. S., 142, 447, 476, 477, 479
Hall, R. G., 150, 151
Halliwell, M. J., 145
Halran, E., 326, 335, 338
Hamada, T., 368, 370
Hamilton, P. A., 504
Hammer, D. A., 230, 231
Hammer, R., 458
Hanbury Brown, R., 116, 138, 145, 153, 169
Hanel, R., 49, 53
Hanisch, R. J., 176
Hanks, T. C., 105
Hans, E. M., 145
Hansen, C. J., 16, 22, 27, 276, 379
Hansen, S. S., 274, 284
Hanson, H. K., 128
Hanson, R. B., 21
Hargrave, P. J., 171, 180, 192
Härm, R., 278
Harnden, F. R., 233, 447, 448
Harper, D. A., 277, 505
Harrington, J. P., 276, 283
Harrington, R., 365, 368
Harris, A., 177, 180, 336, 342, 354
Harris, A. W., 79, 80
Harris, B. J., 325, 327
Harris, D. E., 166, 173, 176, 177, 185, 190
Harris, D. L., 146, 147, 150, 151, 153
Harrison, E. R., 540
Hartman, R. C., 314
Hartmann, L., 237, 241, 441, 446, 448, 450, 453-56, 475, 477, 481
Hartmann, W. K., 87, 90, 91, 104, 107
Hartquist, T. W., 248, 252
Hartsuijker, A. P., 172, 180, 195, 200, 208
Hartwick, F. D. A., 209, 212, 333
Harvel, C. A., 209
Harvey, G. A., 324
Harvey, J. W., 481
Harvey, P. M., 268, 284
Harwit, M., 508
Haslam, C. G. T., 166
Hauck, R., 126-30
Haves, P., 187, 205, 325, 327
Hawking, S. W., 520
Hawley, S. A., 324, 326, 330, 346, 420
Hayakawa, S., 289, 294, 301, 314
Hayashi, C., 20, 83, 88, 98, 106, 108, 109
Hayes, D. S., 116, 117, 119, 120
Hazard, C., 167, 198, 326, 327, 334, 342
Hearn, A. G., 445, 447
Hearn, D. R., 371, 386
Heasley, J. N., 454, 471
Heckman, H. H., 422, 424, 425
Heeschen, D. S., 332
Hege, E. K., 366, 372, 376, 393
Hegyi, D. J., 517
Heiles, C., 292, 506
Heintz, W. D., 115, 146-49, 151, 153, 368
Heise, J., 372
Heisenberg, W., 297
Henbest, S. N., 180
Henize, K. G., 375
Henkel, C., 407, 409
Henon, M., 104
Henoux, J. C., 442
Henry, J. P., 327, 346
Henry, P. S., 522-24, 526
Henry, R. C., 463, 472
Herbig, G. H., 275, 476
Herbison-Evans, D., 138, 145
Herbst, E., 401
Herman, R., 489
Hermsen, W., 314, 315
Hershey, J. L., 149, 150
Hertzsprung, E., 15
Hesser, J. E., 379
Hewish, A., 166, 167, 192
Hewitt, A., 365
Hiebert, R. D., 508
Hier, R., 337
Higbie, P., 314
Higdon, J. C., 308, 311
Hildebrand, R. H., 505
Hilditch, R. W., 126-30, 133, 137, 139
Hilgeman, T., 267
Hill, E. R., 342
Hill, F., 264, 266, 274, 280
Hill, G., 126-30, 133, 135, 137, 139
Hill, J. K., 235, 244
Hill, J. M., 169
Hill, S. J., 271, 278, 281
Hillas, A. M., 289, 290, 312, 316
Hills, J. G., 100, 394
Hiltner, W. A., 156, 197, 324, 332, 346
Hilton, W. B., 158
Hine, R. G., 207, 336
Hinkle, K. H., 265, 266, 271, 274, 417
Hinteregger, H. F., 327, 353
Hintzen, P., 189, 211, 372, 376, 392
Hinzen, P., 324, 325, 334
Hirabayashi, H., 504
Hiraiwa, H., 310
Hirshfeld, A., 251
Hirst, W. P., 148, 151
Hjellming, R. M., 477
Hobbs, R. W., 243, 284, 325, 327, 472
Hodge, P., 333, 339, 340
Hodson, S. W., 18, 19, 21, 25-29, 35-37, 378
Hoekstra, R., 450, 474
Hoffman, W. F., 268
Høg, E., 147
Högbom, J. A., 167, 171, 172, 180, 189, 190, 192, 202
Hogg, D. E., 190, 197
Hollars, D. R., 475
HOLLENBACH, D. J., 219-62; 222, 223, 225, 226, 235, 238, 242, 244, 245, 247, 249-51
Holman, G. D., 186, 256, 294
Holmes, J. A., 294, 298, 299, 307
Holt, S. S., 190, 325, 327, 344, 350, 479
Holzer, T. E., 232, 457
Honeycutt, R. K., 272
Hopponen, J. D., 498, 517
Horan, S., 311
Horedt, G. P., 80, 88, 101
Hoshi, R., 20
Hoskins, D. G., 324
Houck, J. R., 49, 67, 508
Houtkevich, S. M., 331, 335, 344
Howell, R., 272, 275, 276
Howell, T. F., 492, 493, 548
Hoyle, F., 267, 348, 349

Huang, S.-S., 138, 145
Hudson, H. S., 268
Huggins, P. J., 264, 271, 276, 278, 280
Huguenin, G. R., 274, 284
Huizenga, H., 372
Huizinga, J. S., 511, 543
Humphreys, R. M., 269, 270, 282, 284, 367
Hunger, K., 384
Hunt, G. E., 56
Hunten, D. M., 109, 450
Huntress, W. T., 248
Huntress, W. T., Jr., 402
Hutchings, J. B., 135, 138, 447
Hyland, A. R., 275

I

Ibanoglu, C., 128
Iben, I., 18, 20, 22, 38
Iglesias, E. R., 245, 248
Illarionov, A., 385
Illarionov, A. F., 545-59
Ingham, W., 177
Inoue, H., 234
Inoue, M., 324, 339
Ionson, J. A., 186, 256, 276, 294, 324
Ip, W.-H, 104
Ipatov, A. V., 194
Ipavich, F. M., 300
Iriarte, B., 127, 144, 149, 156
Isaacman, R., 100
Itoh, H., 233, 234

J

Jacobson, T. S., 284
Jacoby, G., 268
Jaffe, W. J., 176, 178, 190, 191
Jaffrin, M. Y., 227
Janssen, M., 496
Janssen, M. A., 495
Jauncey, D. L., 168, 325, 327
Jeans, J. H., 81
Jefferies, J. T., 463, 466
Jefferts, K. B., 402
Jenkins, C. J., 171, 179, 180, 189, 192, 195
Jenkins, E. B., 233, 242, 506
Jenkins, L. F., 152, 154
Jenkner, H., 19
Jennings, M. C., 447
Jennings, R., 49
Jennison, R. C., 168, 169
Jensen, E. B., 406
Johns, M., 326, 335, 339, 340
Johnson, H. E., 300
Johnson, H. L., 127, 136, 144, 149, 156, 447
Johnson, H. M., 203
Johnson, H. R., 447
Johnson, K., 324, 326
Johnston, K. J., 172, 207, 274, 276, 277, 325, 326
Johnston, M. D., 185, 325, 327, 344
Jokipii, J. R., 256, 291, 292, 296, 298, 299, 301, 308, 310, 311
Joly, M., 421, 432
Jones, A. V., 43
Jones, B., 49, 267, 283
Jones, B. J. T., 543
Jones, F. C., 301, 308, 310, 311
Jones, T. J., 66
Jones, T. W., 178, 204, 273, 326, 328, 333, 338, 339, 342, 345, 348-50, 477
Jordan, C., 440, 444, 446, 448-50, 457
Jordan, S. D., 440
Jørgensen, H. E., 127, 129, 130, 160
Joselyn, J. A., 457
Joshi, M. N., 194
Josse, M., 145
Joyce, R. R., 250, 505
Judge, D. L., 55
Juliusson, E., 306
Jura, M., 249, 251, 268, 275

K

Kafatos, M., 254, 268, 279, 281, 284
Kahn, S., 387
Kaidanovskii, N. L., 194
Kakar, R. K., 266
Kalberla, P., 166
Kaler, J. B., 383
Kalkofen, W., 441, 458-61, 482
Kamper, K., 419
Kamper, K. W., 229
Kamperman, T. M., 450, 474
Kanbach, G., 314, 315
Kapahi, V. K., 167, 171, 177, 192
Kaplan, S. A., 235
Kapranidis, S., 367, 386
Karp, A. H., 25
Katgert-Merkelijn, J., 171, 193
Kato, T., 258
Katz, J. I., 350
Kaula, W. M., 87, 89, 94, 105
Kawara, K., 275, 277
Keachie, S., 492, 493
Kearsey, S., 308
Keich, W. L., 442, 450-56, 460, 461, 473
Keller, J. B., 496
Kellermann, K. I., 165, 168, 194, 195, 325, 327, 334, 347, 348
Kellogg, E., 550
Kemp, J. C., 324, 339, 345, 352
Kenderdine, S., 169, 327
Kennel, C. F., 231
Kent, S. M., 258
Kenyon, S. J., 283, 284
Kephart, J. E., 272
Kerr, F. J., 274, 279, 505
Khachikian, E. Y., 341
Khaliullin, Kh. F., 137
Khare, B. N., 267
Kiess, C. C., 55
Kiess, H. K., 55
Kikuchi, S., 324, 339
King, D. S., 16-19, 21, 22, 25-29, 35-37
King, K. J., 49
Kinman, T. D., 324-26, 332, 334, 335, 338, 340
Kinzer, R. L., 325, 327
Kippenhahn, R., 440
Kirkpatrick, R. C., 239
Kirshner, R. P., 229, 232-34, 242, 419, 433
Kirsten, T., 79
Kish, J. C., 306, 309, 425, 426
Kislyakov, A. G., 492, 493
Kitamura, M., 120, 128
Klein, U., 166
Kleinmann, S. G., 274, 277
Klemperer, W., 401
Knacke, R. F., 49, 52, 53, 58, 60, 326, 335, 339, 340, 345
Knapp, G. R., 243, 251, 264, 266, 271, 276-80, 447, 476, 505
Knapp, S. L., 271
Kneer, F. J., 472
Kniffen, D. A., 314
Knight, C. A., 327, 353
Kobayashi, T., 310
Kobayashi, Y., 275, 277
Koch, R. H., 124, 126-28, 130, 136-39, 142, 156
Koechlin, L., 145
Koegler, C. A., 137
Koester, D., 367-69, 371-74, 377, 388-90
Kojoian, G., 325, 327, 342
Kollberg, E., 281
Koipanen, D. R., 325
Kompaneets, A. S., 556, 558
Kondo, H., 127
Kondo, M., 120, 128
Kondo, Y., 115, 279, 447, 450, 473-75
Koniges, A., 478
Königl, A., 200, 202, 349, 350
Konno, M., 324, 339
Kopylov, I. M., 156
Korchakov, A. A., 348
Korol'kov, D. V., 194

Koski, A. T., 257, 326, 330, 336
Kotanyi, C. G., 209
Kovetz, A., 391, 392
Kozlowski, M., 382
Kraft, R. P., 19, 21, 38, 463, 481
Kraichnan, R. H., 296, 297
Krall, N. A., 222, 223, 230, 231
Kraus, J., 324
Kraushaar, W. L., 314
Krikorian, R., 463, 466
Kristian, J., 209, 212, 275, 333
Kríz, S., 115
Kronberg, P. P., 167, 187, 292, 325, 327
Kruskal, M. D., 253
Kruszewski, A., 345
Krymsky, G. F., 255
Kudritzki, R. P., 279
Kuhr, H., 325, 327
Kuiper, G. P., 48, 160
Kuiper, T. B. H., 266, 271, 279
Kulsrud, R. M., 293, 295-97, 302
Kumar, S., 49, 53
Kunde, V., 49, 53
Kundu, M. R., 269
Kunkel, W. E., 119, 152, 476, 479
Kuperus, M., 458
Kupferman, P. N., 324
Kurt, V. G., 541
Kurtz, R. F., 505
Kurucz, R. L., 120, 441, 452, 459-61
Kusaka, T., 83, 106
Kutner, M. L., 251, 407
Kuzma, T. J., 19, 377
Kwan, J., 245, 250, 264, 266, 274, 280
Kwok, S., 266, 268, 274, 282-84
Kylafis, N. D., 364

L

Labeyrie, A., 145
Lachiéze-Rey, M., 303, 311
Lacombe, C., 187
Lacroute, P., 147
Lacy, C. H., 115, 119, 121, 131, 133, 146, 148, 149, 153, 160
Lacy, J. H., 49, 250, 277
Lacy, J. L., 310, 311
Lada, C. J., 228, 248, 251, 252, 277
Laing, R., 181
Lake, G., 551
Lamb, D. Q., 364, 391, 396
Lambert, D. L., 158, 264-66, 269, 271, 272, 274, 275, 417, 434, 450, 474, 475
Lamers, H. J. G. L. M., 447, 450, 474
Lamla, E., 326, 335, 338, 340
Lampe, M., 231
Lampton, M., 367, 371, 387, 479
Landauer, F. P., 209, 212, 333
Landolt, A. U., 324, 338, 382
Landstreet, J. D., 276, 344, 345, 352, 379, 380
Lane, A. P., 274, 284
Lang, K. R., 503, 504
Langer, W. D., 249, 401-5
Lari, C., 171, 178, 180, 189, 190, 193, 210, 325, 327
Larrabee, A. I., 49
LARSON, H. P., 43-75; 43, 44, 46, 49, 51, 55, 56, 58, 60-62, 64, 66, 68-73, 250
Larson, R. B., 77
Lasker, B. M., 203, 209, 243, 379
Laurent, C., 233
Laury-Micoulant, C., 274
Lauterborn, D., 18
Lavrov, A. P., 194
Law, S. K., 272
Lawrence, A., 185
Lazareff, B., 407
Lea, S. M., 550
Leach, R. W., 276
Leacock, R. J., 325, 327, 331
Lebedinskii, A. I., 83
Lebofsky, L. A., 72
Lebofsky, M. J., 258, 324, 326, 333, 339-41, 345, 350, 351, 355
Lebrun, F., 304, 315
Lebskii, Y. V., 492, 493
Lecacheux, J., 49, 51, 56, 58
Lecar, M., 92, 100
Leckrone, D. S., 134, 160
Le Contel, J. M., 446
Ledden, J. E., 336, 349
Lee, L. C., 296
Lee, M. A., 295, 311
Lee, T., 435
Leer, E., 255, 304
LeFèvre, J., 268
Legg, T. H., 168
LeGuet, F., 291
Leibacher, J. W., 458, 482, 483
Leighton, R. B., 264, 271, 276, 278, 280
Lemaire, P., 471
Leong, V., 314
Lepine, J. R. D., 283
Lequeux, J., 294, 325, 327, 431, 432
Lerche, I., 225, 383
Lester, D. F., 58, 60
Leung, C. M., 250, 345
Leung, K.-C., 131, 135, 138, 156
Leventhal, M., 311
Levich, E. V., 557
Levin, B. J., 103
Levy, D. R., 496
Lewin, W. H. G., 371
Lewis, J. S., 53-55, 72, 92, 100, 265, 267
Lezniak, J. A., 306
Lichti, G. G., 314, 315
Liebe, H. J., 498, 517
LIEBERT, J. W., 363-98; 337, 364-68, 371, 372, 374, 376, 379, 383, 384, 386, 388, 390, 392-94
Lightman, A. P., 350, 351
Liller, W., 325, 327, 346
Lilley, A. E., 498
Lind, J., 475
Lindemann, E., 126-30
Lindman, E. L., 224
Lindstrom, P. J., 424, 425
Linfield, R. P., 327
Lingenfelter, R. E., 298, 311
Linke, R. A., 265, 266, 405, 407, 410, 411, 413, 415, 417, 430
Linnell, A. P., 127
LINSKY, J. L., 439-88; 269, 270, 440, 442, 445-61, 463-66, 471-74, 477, 478, 481
Lippincott, S. L., 149, 151
Liszt, H. S., 279, 403
Lites, B. W., 451, 452, 456
Little, A. G., 172, 325, 327, 337
Little, L. T., 166
Litvak, M. M., 252
Liu, S. Y., 472
Livingston, W., 480
Ljutyi, V. M., 345
Lo, K. Y., 265, 275, 282
Locke, J. L., 168
Lockhart, I. A., 172, 193
Lockwood, G. W., 324, 338
Loeser, R., 451, 452, 456
Loewenstein, R. F., 277
Lomb, N. R., 145
Lombardini, P., 508
London, R., 250
Longair, M. S., 169, 171, 183, 193, 207, 538
Lo Presto, J. C., 463
Lord, J. J., 310
Lorre, J., 332, 333
Lovelace, R. V. E., 170, 349, 351
Low, F. J., 48, 49, 272, 275, 276, 505

Lowman, P., 49, 53
Loyd, E. G., 508
Lubin, P. M., 522, 523, 528-30
Lucas, R., 407, 411
Lucke, R. L., 234
Lucy, L. B., 274
Lutz, B. L., 56
Lutz, J. H., 283, 463
Lutz, T. E., 462-64
Luyten, W. J., 364, 393
Lynden-Bell, D., 84, 212, 351
Lynds, C. R., 209, 212, 324, 326, 333, 337
Lyon, J., 266
Lyttleton, R. A., 84

M

MacAlpine, G. M., 235, 257
MacCallum, C. J., 311
Macdonald, G. H., 169, 197, 327
MacGregor, K. B., 441
Machado, M. E., 452, 455
Machnik, D. E., 407
Maciel, W. J., 270
Mackay, C. D., 171, 193, 325, 327
Mackey, M. B., 167, 198
Macleod, J. M., 324, 340
Madore, B. F., 15, 28
Maehl, R. C., 425
Magalashvili, N. L., 132
Magnan, C., 474
Maguire, W., 49, 53
Maihara, T., 275, 277
Maillard, J. P., 48, 49, 51, 56, 58, 60
Malina, R., 372
Maltby, P., 169
Mal'tsev, V. A., 492, 493
Mammano, A., 138, 284
Manchester, R. N., 280, 325, 327, 383
Manfroid, J., 243
Mann, P. J., 124, 126-31, 136-40, 142, 143, 156
Mantz, A. W., 55
Maran, S. P., 243, 442, 453-56, 461, 472, 473
Marano, B., 325, 327
Maraschi, L., 311
Mardirossian, F., 122, 126-28, 130, 132, 136, 137, 139
Margolis, J. S., 56
Margon, B., 371
Margoni, R., 138
Marilli, E., 448, 450
Marionni, P. A., 266
Mariska, J. T., 445, 457
Marlin, H. W., 495
Marscher, A. P., 349
Marsden, R. G., 312
Marsh, K. A., 284
Marshall, F. E., 327, 344, 350
Marten, A., 49
Martin, D. R., 510
Martin, P. G., 272, 323, 324, 326, 341, 344, 345, 352
Martin, T. Z., 49, 58
Martins, D. H., 209
Martynov, D. Ya., 137
Masnou, J. L., 314, 315
Mason, G. M., 309
Mason, H. P., 56
Massano, W., 407
Massey, P., 374
Masson, C. R., 178, 198, 202
Mast, T. S., 306, 309, 310
Masters, A. R., 364
Materne, J., 268, 276
Mather, J. C., 495, 496, 500, 512
Mathis, J. S., 243, 267, 268
Matsuda, T., 538
Matsui, T., 105
Matsumoto, T., 314
Matsushima, S., 368
Matthews, K., 243, 272, 335, 340, 350
Matthews, T. A., 176
Matveyenko, L., 325, 327
Mauder, H., 129
Mauger, B. G., 311
Mayeda, L. K., 435
Mayer, C. J., 178
Mayer, W. F., 371
Mayer-Hasselwander, H. A., 314, 315
Maza, J., 324, 326, 329, 341, 344, 345, 350, 352
Mazurek, T. J., 381
Mazzitelli, I., 388
McAlister, H. A., 144, 145
McBride, J. B., 230
McCabe, E. M., 265
McCarthy, D. W., 272, 275-77
McCarthy, J. R., 67
McClatchey, R. A., 499
McClintock, J. E., 371
McClintock, W., 450, 455, 460, 463, 466, 472, 474
McClure, R. D., 79, 393
McCluskey, C. E., 115
McColl, M., 492, 493
McCook, G. P., 364
McCord, T. B., 66
McCray, R., 220, 221, 232, 235, 242, 250, 251, 254, 294
McCrea, W. H., 83
McCuskey, S. W., 81, 108
McEllin, M., 171, 179
McGimsey, B. Q., 325, 326, 331, 333, 339, 351, 355
McGraw, J. T., 378, 379
McHardy, I. M., 177, 210, 211
McIvor, I., 298
MCKEE, C. F., 219-62; 178, 191, 221-23, 225, 226, 230, 231, 233-39, 241, 242, 245, 249-51, 256, 304, 305
McKellar, A., 155
McKellar, A. R., 56
McLaren, R. A., 265, 271, 274, 275, 280
McLean, I. A., 276
McLeish, C. W., 168
McMillan, R. S., 268, 273, 275
McMullan, D., 322
McNamara, D. H., 127-29, 137, 156, 158
McVittie, G. C., 186
McWhirter, R. W. P., 462
Mebold, U., 239, 257
Medd. W. J., 324
Meegan, C. A., 310
Meeks, M. L., 498
Meister, J., 424
Melchiorri, B., 508, 530
Melchiorri, F., 508, 522, 523, 530, 555
Meloy, D. A., 180, 198, 210
Meneguzzi, M., 306
Mengel, J. G., 280
Merkelijn, J. K., 325
Merrill, J. E., 122
Merrill, K. M., 264, 267, 269, 273, 275, 280, 282, 284, 324, 326
Merrill, P. W., 284
Mestel, L., 390
Meuve, R., 387
Mewaldt, R. A., 422-26
Mewe, R., 229, 233, 234
Meyer, J. P., 309
Meyer, P., 289, 306
Meyer, S., 506
Meyerott, A. J., 203
Meyers, K. A., 192
Mezger, P. G., 503
Mezzetti, M., 122, 126-28, 130, 132, 136, 137, 139
Michalitsianos, A. G., 268, 279, 281, 284
Michaud, G., 19, 27, 28, 385-87, 389
Michel, G., 49
Mickelson, M., 55, 60
Mihalas, D., 465, 467
Mikami, Y., 324, 339
MILEY, G. K., 165-218; 165, 166, 168, 169, 171-73, 175-78, 180-82, 189-91, 194-98, 200-5, 208-10, 342, 346, 351, 353
Milione, V., 251
Milkey, R. W., 454, 465
Millea, M. R., 492, 493

Miller, H. R., 326, 333, 339, 351, 355
Miller, J. M., 208
Miller, J. S., 239, 240, 324, 326, 330, 331, 336, 345, 356
Miller, S. C., 251
Millis, R. L., 139
Mills, B. Y., 327, 337, 342
Mills, D. M., 169
Milne, D. K., 503
Milone, E. F., 142, 159
Milton, R. L., 377
Minkowski, R., 257, 418
Mitchell, R. L., 127, 144, 149, 156
Mitton, S., 169
Mizuno, H., 109
Mizutani, H., 105
Modisette, J. L., 447, 450, 474
Moffet, A. T., 165, 168, 169, 182, 187, 195, 325, 327, 342
Moffett, T. J., 116, 325, 327, 328, 368, 370, 374
Moiseyev, I., 325, 327
Moore, R., 220, 232
Moore, R. L., 326, 331-33, 336, 338, 339, 346, 351, 355, 393
Moore, R. T., 234, 457
Moore, W. E., 233
Moorwood, A., 49
Moos, H. W., 463, 472
Moran, J. M., 251, 274, 276, 277, 284
Morbey, C. L., 145, 147
Morgan, B. L., 144
Morgan, J. G., 143
Morgan, T. H., 450, 474
Morgan, W. W., 136, 139
Morris, D., 168, 325, 327
Morris, M., 265, 266, 271, 273-78, 280-83, 415
Morrison, D., 72, 447
Morrison, N. D., 442, 455
Morrison, P., 177, 193
Morrison, P. Jr., 257
Morton, D. C., 160
Morton, W. A., 251
Moseley, H., 277
Moseley, S. H., 505
Mott-Smith, H., 227
Mould, J., 372, 374
Mouschovias, T., 227, 302, 303
Muchmore, D. O., 386
Muehlner, D. J., 500, 502, 505, 508, 522-24, 527, 543
Mufson, S. L., 254, 266, 279, 325-28, 333, 339, 351, 355
Muhleman, D. O., 277
Mullan, D. J., 227, 270, 277, 444, 451, 452, 456, 473, 474
Müller, D., 306, 311
Muller, R. A., 495, 527
Münch, G., 60
Munro, R. E. B., 325
Munro, R. H., 457
Murdoch, H. S., 324, 325, 327
Murray, S., 550
Murray, S. S., 229
Mushotzky, R. F., 190, 325, 327, 344, 350, 479
Mutel, R. L., 277, 477
Muzylev, V. V., 253
Myers, P. C., 293

N

Nadeau, D., 250
Nakagawa, Y., 107, 442
Nakano, T., 83, 106, 304
Nakazawa, K., 88, 98, 108, 109
Nanos, G. P., 530
Natale, V., 508, 522, 523, 530, 555
Nather, R. E., 374, 379
Neal, D. S., 172
Neff, J. S., 119
Neff, S. G., 195
Neidhöfer, J., 166
Nelson, B., 122
Netzer, H., 350
Neugebauer, G., 243, 250, 268, 272, 275, 326, 335, 340, 341, 350
Neupert, H. E., 379
Neville, A. C., 169, 327
Ney, E. P., 265, 267, 275
Nguyen-Q-Rieu, 274
Nicolas, K. R., 445, 457
Niehaus, R. J., 128
Niell, A. E., 195, 327
Nieto, J.-L., 333
Nishimura, J., 310
Nishimura, T., 505
Nishioka, N. S., 500, 512
Niu, K., 310
Niva, G. D., 28, 29
Noerdlinger, P. D., 349
Noguchi, K., 275, 277
Nordsieck, K. H., 324, 326, 327, 334, 338, 342, 348
Nordström, B., 126, 137, 143
Norman, C. A., 187, 190, 213, 251, 252, 257
Northover, K. J. E., 180, 192, 551
Nousek, J. A., 234
Novikov, I. D., 540
Noyes, R. W., 440, 442, 445, 483

O

Oberbeck, V. R., 105
O'Brien, G., 269, 450, 475
O'Dell, S. L., 324-28, 334, 336, 340, 342, 348-50
O'Donnell, W. C., 367
Oegerle, W. R., 302, 450, 459, 462, 473
Oemler, A., 282
Ogden, P. M., 250
Ogelman, H. B., 314
Ogilvie, K. W., 229
Okazaki, A., 128
Oke, J. B., 207, 326, 330, 335, 340, 341
Okuda, H., 275, 277
Olsen, E. H., 143
Olson, E. C., 126-28, 133, 136, 137, 156
Olson, G. L., 447
Onéto, J. L., 145
Oort, J. H., 194, 209, 258, 301
Öpik, E. J., 92, 93, 104
Oppenheimer, M., 248
Ormes, J., 306
Ormes, J. F., 306, 425
Orszag, S. A., 235
Orth, C. D., 306, 309-11
Orton, G. S., 49
Osaki, Y., 19, 379
Osborne, J. L., 307, 308
Osmer, P. S., 203, 209
Oster, L., 269
Osterbrock, D. E., 239, 241, 257, 326, 330, 336
Ostriker, J. P., 25, 187, 221, 233, 234, 251, 255, 291, 304, 305, 307, 308, 364, 377, 428
O'Sullivan, J. D., 193
Owen, F. N., 173, 175, 177-79, 195, 198, 202, 204, 205, 210, 211, 325-28, 333, 338, 339, 342, 477, 479
Owen, T., 49, 53, 55, 56, 58, 60
Owens, A. J., 306
Owens, D. K., 505, 527
Ozel, M. E., 314
Ozernoy, L. M., 542

P

Pacholczyk, A. G., 178, 182, 183, 187, 195, 200
Pacht, E., 324
Pacini, F., 351
Paczynski, B., 381
Padalia, T. D., 126, 130
Padrielli, L., 171, 193, 325, 327
Pagel, B. E. J., 421, 432, 450, 463, 464
Palimaka, J. J., 208
Pallister, W. S., 322
Palmer, H. P., 168, 169
Palmer, P., 265, 273, 275, 278, 282, 283, 415
Papadopoulos, K., 230, 231

Papanastassiou, D. A., 79
Papousek, J., 128
Pardo, R. C., 434
Paresce, F., 371
Pariyskiy, Yu. N., 194, 551
Parke, E. N., 483
Parker, E. N., 231, 292, 298, 299, 302, 303, 310, 312
Parker, R. A. R., 233, 235, 240
Parma, P., 180
Parsons, S. B., 374, 375
Partridge, R. B., 492, 493, 519, 521-24, 548, 551
Pasachoff, J. M., 471
Paschmann, G., 228
Paul, J. A., 304, 307, 314, 315
Pauliny-Toth, I. I. K., 194-96, 325, 327, 347, 348, 503
Pauls, T., 413
Payne, D. G., 350, 351
Payne-Gaposchkin, C., 277
Pearl, J., 49, 53
Pearson, T. J., 172, 181, 195, 196, 249, 327, 334
Pechernikova, G. V., 91
Pedersen, R. J., 492, 493
Peebles, P. J. E., 540, 541
Peimbert, M., 239, 283, 416, 418-21
Pel, J. W., 16
Pellat, R., 303
Pelyushenko, S. A., 548
Penston, M. J., 336
Penston, M. V., 335, 336
Penzias, A. A., 402, 405, 406, 410-15, 428, 430, 492-94, 521-23, 530, 537, 548
Perley, R. A., 172, 198-200, 202, 204, 205
Perola, G. C., 169, 175-78, 180, 185-87, 189-91, 194, 195, 209, 210, 311, 342
Perrenod, S. C., 543
Perron, C., 310
Persson, S. E., 250, 268, 283
Pesses, M. E., 255
Peters, B., 290, 307
Peterson, B. A., 542
Peterson, B. M., 197, 203, 332
Peterson, C. J., 209
Peterson, J. O., 16, 27, 28
Peterson, V. L., 451, 452
Petrie, R. M., 123, 132, 134, 135
Petschek, A. G., 350
Phillips, J. P., 268, 274, 276, 279
Phillips, M. J., 481
Phillips, M. M., 326, 330, 336
Phillips, T. G., 264, 271, 276, 278, 280
Pica, A. J., 324, 325, 327
Piccinotti, G., 314
Piddington, J., 299
Pierce, W. P., 293, 296
Piirola, V., 479
Pikel'ner, S. B., 235, 241
Pilcher, C. B., 49, 58, 66, 72
Pilkington, J. D. H., 325, 327
Pinkau, K., 315
Pipher, J. L., 45, 508
Pirraglia, J., 49, 53
Plavec, M., 124, 126-28, 130, 136-39, 142, 156
Podosek, F. A., 417, 424
Pollack, J. B., 43, 49, 66, 67, 108
Pollock, A. M. T., 316
Pollock, J. T., 325, 327
Polyachenko, V. L., 84
Ponnamperuma, C., 49, 53
Pooley, G., 326, 327, 334, 342
Pooley, G. G., 172, 173, 180, 187, 325
Popov, M. V., 115
POPPER, D. M., 115-64; 115, 116, 120, 122, 123, 125-30, 132-39, 142, 143, 145, 158-60
Porcas, R. W., 195, 325, 327, 328
Porter, F. C., 272
Potash, R. I., 200
Poteet, W. M., 505
Praderie, F., 440, 441, 446, 447, 450, 482
Prasad, S. S., 248
Pravdo, S. H., 229, 233, 325
Predmore, C. R., 274, 284
Prentice, A. J. R., 80
Preston, G. W., 463
Preuss, E., 195, 325, 327
Price, R. M., 172, 173, 180, 209, 307
Priester, W., 503
Primini, F. A., 371
Prince, T., 310
Pringle, J. E., 204, 351
Prinn, R. G., 53, 54
Priser, J., 365
Prishchep, V. L., 309
Probst, R. G., 149
Probstein, R. F., 227
Ptuskin, V. S., 289, 298, 306, 308, 311
Pucillo, M., 156
Puetter, R. C., 267, 283, 284
Puget, J. L., 548
Pumphrey, W. A., 143
Puplett, E., 510
Purcell, G. H., 195, 327
Purton, C. R., 277, 282-84, 325, 337, 342
Puschell, J. J., 324, 326, 328, 333, 338, 339, 342
Puzanov, V. I., 492, 493
Pye, J. P., 327, 346, 447

R

Rafert, J. B., 139
Rago, J. F., 239
Raisbeck, G. M., 306, 308, 310
Raizer, Yu. P., 222, 224, 227
Rakos, K. D., 147
Ramaty, R., 298, 311
Ramsey, L., 275
Rank, D. M., 49, 58, 60, 266
Rao, K. R., 55
Raphaeli, Y., 551
Rappaport, S. A., 255, 371
Rasmussen, I. L., 290, 307
Rather, J. D. G., 235
Raymond, J. C., 229, 232, 233, 235-37, 240-42, 446, 448, 450, 457, 475
Rayo, J. F., 420
Readhead, A. C. S., 168, 172, 181, 192, 195-97, 202, 204, 327, 334, 349, 352, 355
Reay, N. K., 276
Redman, R., 265, 274, 281
Redman, R. O., 271, 276, 280
Reed, R. A., 49
Rees, M. J., 170, 180, 193, 200, 202, 204, 209, 213, 349-52, 355, 530, 550
Refsdal, S., 18
Reich, W., 166
Reid, M. J., 265, 270, 274, 276, 277, 281, 284
Reid, R. J. O., 316
Reif, K., 166
Reifenstein, E. C., 503
Reimers, D., 278, 279, 381, 473
Reinhardt, M., 185
Rengarajan, T. N., 291
Renzini, A., 278, 280, 382, 441, 447, 459-61
Reynolds, R. J., 250
Rich, A., 324
Richards, P., 543
Richards, P. I., 107
Richards, P. L., 498, 500, 512, 516
Richards, R. S., 168
Richardson, J. A., 371
Richer, H., 365
Richstone, D., 324, 332
Rickett, B. J., 296
Ridgway, S. T., 43, 49, 52, 53, 55, 66, 264-66, 269, 271, 274, 275, 454
Riegler, G., 479
Riegler, G. R., 325
Rieke, G. H., 258, 324-26, 333, 334, 339-41, 345, 350, 351, 355, 505
Riepe, J., 365
Rieu, N. Q., 283
Righini-Cohen, G., 250

Riley, J. M., 169, 171-73, 178, 180, 187, 193, 195
Ringwood, A. E., 80
Roberge, W. G., 245
Roberts, W. W., 221, 251
Robertson, R. M., 450, 455, 460, 466, 472, 474
Robinson, E. L., 364, 374, 378, 379
Robinson, R. D., 481
Robson, E. I., 511, 543
Roche, P. F., 283
Rodgers, A. W., 15, 17, 452
Rodono, M., 450
Rodriguez-Kuiper, E. N., 266
Roesler, F. L., 55, 60, 250
Roffi, G., 325, 327
Rogers, A. E. E., 327, 353
Rogerson, J. B., 402, 429, 447
Roll, P. G., 492, 493, 548
Roman, N. G., 136
Romanishin, W., 185, 367, 382, 393
Romero, H. V., 508
Romney, J. D., 195, 327
Rönnäng, B., 325, 327
Rönnäng, B. O., 194-96
Rood, R. T., 429
Rose, W. K., 278
Rosen, B. R., 277
Rosenbauer, H., 228
Rosner, R., 445, 447, 448, 478, 481
Ross, J. E., 264
Ross, R. R., 16, 22, 27
Rothman, L. S., 499
Rothschild, R. E., 327
Rothschild, R. J., 325
Rowson, B., 168, 169
Rubin, V. C., 209
Rudnick, L., 173, 175-77, 179, 198, 202, 204, 205, 210, 211, 326, 328, 333, 338, 339, 342
Ruskol, E. L., 83
Russell, C. T., 225, 229
Russell, H. N., 122
Russell, R. W., 49, 267, 283, 284
Russell, W. A., 435
Rydbeck, O. E. H., 325, 327
Rydgren, A. E., 119, 152
Rygh, B. O., 463, 464, 466
Ryle, M., 167, 169, 171, 176, 180, 183, 192, 479

S

Sacco, B., 314
Sack, N., 271, 278, 280
Sadik, A. R., 133, 142
Safronov, V. S., 79, 80, 83-86, 89, 91, 94, 98, 99, 101, 103, 105, 107
Sagan, C., 100, 267
Sagdeev, R. Z., 231
Sahade, J., 138, 145
Saito, M., 258
Saito, Y., 258
Salomonovich, A. E., 492, 493
Salpeter, E. E., 234, 240, 247, 268, 269, 274, 278, 280, 368, 370
Salvati, M., 351
Samuelson, R., 49, 53
Sancisi, R., 313
Sandage, A., 16, 21, 22, 25, 36, 38, 341
Sandel, B. R., 240
Sanford, M. T., 272
Sanner, F., 279
Santiago, J. J., 267
Sareyan, J. P., 446
Sarg, K., 475
Sargent, D. G., 277
Sargent, W. L. W., 209, 212, 258, 333, 341, 348, 349, 418
Saslaw, W. C., 193
Sass, C., 370, 371
Sato, H., 538
Sato, S., 275, 277
Saulson, P. R., 522-24, 526, 528, 529
Savage, B. D., 267
Scalo, J. M., 143, 264, 267, 268, 280, 283
Scanlan, R. J., 144
Scarfe, C. D., 16, 128, 134, 135, 145
Scargle, J. D., 269
Scarrotte, S. M., 322
Scarsi, L., 314, 315
Schaack, D., 49
Schallwich, D., 551
Scharmer, G. B., 464
Schatzman, E., 384
Scherb, F., 250
Scheuer, P. A. G., 167, 170, 181, 183, 189, 192, 197, 204, 296, 336, 349, 352, 355
Schiffer, F. H. III, 209, 477, 478
Schild, R. E., 156
Schilizzi, R. T., 189, 192, 194-96, 327
Schlesinger, B. M., 18
Schlickeiser, R., 314
Schmidt, E. G., 15, 21, 25, 28
Schmidt, G. D., 197, 203, 268, 275, 322, 332, 345, 356
Schmidt, K. M., 306
Schmidt, M., 275, 324, 332, 353, 364
Schmidtke, P. C., 446, 448, 450
Schmitt, J. L., 340
Schmitz, F., 441, 447, 455, 458-61
Schmitz, M., 479
Schneeberger, T. J., 450
Schneider, D. P., 131, 156
Schonberner, D., 384
Schoolman, S. A., 119
Schramm, D., 382, 427, 430
Schreier, E. J., 203
Schultz, G. V., 274
Schulz, H., 368, 369
Schwartz, D. A., 185, 190, 203, 325, 327
Schwartz, J., 325, 327
Schwartz, R. D., 239, 242, 243
Schwartz, U. J., 167
Schwarz, J., 185
Schwarzschild, M., 270, 278
Schweizer, F., 209
Sciama, D. W., 349, 352
Sckopke, N., 228
Scott, J. F., 325, 327
Scott, J. S., 172, 178, 186, 187, 189, 195, 198-200, 202, 204, 211, 256, 291, 294, 304
Scott, P. F., 166, 176, 325, 327
Scott, R. L., 325, 327, 331
Scoville, N. Z., 250, 266, 274, 280, 506
Scudder, J. D., 229
Seaquist, E. R., 277, 283
Searle, L., 421
Seaton, M. H., 283
Seaton, M. J., 383
Seiden, P. E., 252
Seielstad, G. A., 327, 349
Sekiya, M., 88, 109
Sellgren, K., 273, 278, 280
Semenova, E. V., 324, 326, 332
Semet, M. P., 79
Serkowski, K., 275, 324, 326
Serlemitsos, P. J., 190, 325, 327, 344, 350, 479
Serov, N. V., 492, 493
Setti, G., 208
Sgro, A. G., 241
Shaffer, B. B., 325, 327
Shaffer, D. B., 195, 325, 327, 342
Shakeshaft, J. R., 492, 493, 503, 548
Shakhovskoy, N. M., 323, 335, 345
Shallis, M. J., 269
Shanny, R., 231
Shapiro, I. I., 327, 353
Shapiro, M. M., 306, 422-24
Shapiro, P. R., 220, 232, 234, 457
Shapiro, S. L., 350, 351
Shaviv, G., 391, 392
Shawl, S. J., 268, 275, 276
Shcheglov, P. V., 234

Shemansky, D. E., 240
Shen, C. S., 311
Shields, G. A., 268, 283, 350, 353, 419, 421
Shimmins, A. J., 167, 198, 324, 325, 327
Shine, R. A., 451, 452, 455, 456, 461, 463-66, 471, 477
Shipman, H. L., 364, 367-73, 375, 376, 382, 383, 385-87
Shivris, O. N., 194
Shklovsky, I. S., 347
Shmeld, I. K., 253
Shobbrook, R.R., 28, 29, 36, 145
Shortridge, K., 209, 212, 333
Shu, F. H., 251
Shukla, P. G., 314
Shull, J. M., 235, 237-39, 241, 249, 250, 256
Siegmund, W. A., 239
Signer, P., 424
Silberberg, R., 306, 422-24
Silevitch, M. B., 231
Silk, J., 190, 213, 233, 234, 242, 245, 248, 251, 252, 542, 550, 553, 554
Silvaggio, P. M., 61
Silverberg, R. F., 310
Silverglate, P., 264
Simard-Normandin, M., 292
Simkin, S. M., 193, 208
Simon, A. J. B., 172, 177, 179, 181, 189, 210, 211
Simon, M., 250, 306, 349, 505
Simon, N. R., 15, 25, 28, 29
Simon, R. S., 327, 349
Simon, T., 250, 447, 451, 456, 477, 478
Simpson, G. A., 309, 316, 425, 426
Simpson, J. A., 309, 424, 425
Simpson, J. P., 49, 53, 54, 58
Sinn, L. A., 208
Sinton, W. M., 49, 58
Siohan, F., 306
Sion, E. M., 364, 366-68, 370, 388, 392
Siquig, R. A., 18
Sivan, J. P., 420
Sivertsen, S., 508
Skadron, G., 255, 304
Skellern, D. J., 209
Skilling, J., 291, 293, 294, 298, 299, 301, 304
Skumanich, A., 442, 460, 471, 481
Slee, O. B., 168, 169, 325, 327, 342
Slingo, A., 176
Slovak, M. H., 284
Smith, A. G., 325, 327, 331
Smith, B. W., 190, 229, 233, 294, 304, 479
Smith, D., 280
Smith, D. F., 231
Smith, E. O., 324, 326, 327
Smith, E. van P., 466
Smith, G., 421, 432
Smith, G. R., 49, 55
Smith, H., 51, 58, 60
Smith, H. A., 72, 73, 250
Smith, H. E., 203, 324, 326, 327, 334, 342, 406, 421
Smith, L. H., 306
Smith, M. A., 481
Smith, M. D., 187
Smith, R. C., 265
Smith, R. L., 278
Smith, S. E., 277
Smoot, G. F., 306, 310, 311, 495, 505, 522, 523, 527-30
Smythe, C., 442, 460
Sneden, C., 419
Snell, R., 402
Snell, R. L., 269, 271
Snow, T. P., 221, 242, 294, 367, 440, 447
Snyder, L. F., 276
Soboleva, N. S., 194
Socker, D. G., 234
Söderhjelm, S., 136, 156
Sofia, S., 244
Soifer, B. T., 45, 267, 268, 277, 283, 284, 508
Solarz, M., 426
Solinger, A., 225
Solomon, P. M., 506
Solomon, S. C., 105
Soltan, A., 327, 346
Sonneborn, G., 18, 19
Sowell, R., 450
Spalding, J. D., 424-26
Spangler, S. R., 187, 192, 328, 477
Sparks, W. M., 25, 389, 393
Spears, D. L., 269, 272, 274-76, 280
Speed, B., 179
Spencer, J. H., 274, 276, 277
Spencer, R. E., 212
Spenser, P. M., 283
Spiegelhauer, H., 306
Spinrad, H., 60, 324, 326, 327, 376
Spitzer, L., 219, 220, 224, 228, 229, 251
Spruit, H. C., 483
Sreenivasan, S. R., 17, 34
Srivastava, R. K., 126, 129, 130
Staelin, D. H., 492, 493
Stagni, R., 138
Stang, P. D., 311
Stankevich, K. S., 492, 493, 548
Stannard, D., 172, 325, 327, 335, 342
Starikova, G. A., 147
Stark, A. A., 407
Stark, J. P. W., 233
Starrfield, S. G., 364, 378, 379, 389, 393
Stauffer, J., 382
Stawikowski, A., 466
Stecker, F. W., 313, 316, 548
Steigman, G., 219, 429
Stein, R. F., 254, 458, 482, 483
Stein, W. A., 48, 49, 267, 280, 324-28, 333, 334, 336, 338-40, 342, 345, 348-50
Steining, R. F., 505
Stellingwerf, R. F., 17, 18, 27-29, 378
Stencel, R. E., 270, 276, 277, 444, 447, 450, 473, 475
Stenflo, J. O., 482, 483
Stenholm, L. G., 483
Stephens, A. E., 311
Stephens, S. A., 289, 291, 303, 310, 311
Stephenson, C. B., 264
Stern, R., 371
Stevenson, D. J., 393
Stobie, R. S., 15, 16, 21, 22, 25-29, 35
Stocke, J., 210, 211
STOCKMAN, H. S. 321-61; 209, 324, 26, 331, 332, 337-39, 342, 344-46, 350-53, 376
Stokes, R. A., 492-94, 548
Stone, E. C., 314, 424-26
Stone, M. E., 221
Storey, J. W. V., 269, 272, 276
Stothers, R., 18-20, 25, 27, 28, 277
Stotskii, A. A., 194
Stover, R. J., 374, 379
Stoy, R. H., 128, 136
Stramek, R. A., 325, 327, 342
Strand, K. Aa., 146, 147, 150, 151, 153, 365, 368
Strandberg, M. W. P., 498
Strecker, D. W., 43, 49, 53, 54, 58, 66, 269
Strel'nitskii, V. S., 252, 253
Strickland, D. J., 283
Strittmatter, P. A., 21, 25, 26, 35, 219, 324-26, 336, 337, 340, 366, 367, 372, 376, 377, 386-89, 392-94
Strobel, D. F., 54
Strom, K. M., 78, 406
Strom, R. G., 180, 187, 189, 190, 192, 198, 202, 204, 210
Strom, S. E., 78, 406
Strong, A. W., 291, 304, 313, 316
Struve, O., 138, 145
Sturrock, P. A., 169

Suemoto, Z., 471
Sugimoto, D., 20
Sulentic, J. W., 332, 333
Sullivan, W. T. III, 208
Summers, A., 49
SUNYAEV, R. A., 537-60; 252, 489, 538, 541-43, 545-49, 551, 552, 554, 555, 557-59
Sutton, E. C., 269, 272, 279
Sutton, J., 342
Sutton, J. M., 325, 327
Svechnikov, M. N., 115
Swan, G. W., 253
Swanenburg, B. N., 314, 315
Swank, J., 477
Swank, J. H., 325
Swarup, G., 167, 189, 192
Swedlund, J. B., 352
Sweeney, M. A., 382
Swenson, G. W., 276
Syrovatskii, S. I., 289, 313, 348
Szebehely, V., 81, 108
Szeidl, B., 29

T

Tabor, J. E., 20
Tademaru, E., 304
Taira, T., 310
Takeda, H., 538
Takeuchi, J., 105
Takeuti, M., 16, 28
Talbot, R. J. Jr., 209, 241
Talent, D. L., 209, 420
Tammann, G. A., 16, 21, 22, 25, 36, 38
Tananbaum, H., 327, 346
Tapia, S., 268, 273, 275, 324, 326, 327, 339, 369
Tarenghi, M., 189
Tarle, G., 426
Tauber, M. E., 108
Taylor, F. W., 55
Taylor, J. H., 280, 383
Taylor, K., 233
Telesco, C. M., 277
Terashita, Y., 368
Ter Haar, D., 83
Terzian, Y., 264, 283
Testerman, L., 275
Thaddeus, P., 407, 489, 507, 517, 538
Thambyahpillai, T., 312
Theys, J. C., 253, 254
Thielheim, K. O., 314
Thomas, R. N., 440, 441, 444, 465, 482
Thompson, A. R., 168
Thompson, D. J., 314, 316
Thompson, I., 344, 345
Thompson, R. I., 258
Thornton, D. D., 492, 493
Thorsos, T., 314
Thorstensen, J., 326
Thronson, H. A., 277
Tidman, D. A., 222, 223, 230
Tifft, W. G., 325, 327, 418
Timofeeva, G. M., 194
Tinkham, M., 498
Tinsley, B. M., 280, 282, 419, 420, 427, 428, 430
Tisserand, F., 90
Tohline, J. E., 326
Tokunaga, A., 49, 52, 53, 58, 60
Tomasi, P., 325, 327
Tomkin, J., 145, 158, 434
Toombs, R. I., 272
Topka, K., 447, 448
Torres, C. A. O., 476
Torres-Peimbert, S., 239, 283, 420
Toussaint, J., 310
Tovmassian, H., 325, 327, 342
Townes, C. H., 49, 269, 272
Traub, W. A., 517
Trauger, J. T., 55, 60
Treffers, R. R., 49, 55, 66, 70, 250, 251, 267
Tremko, J., 128
Treverton, A. M., 325
Trimble, V., 367, 370, 399, 422, 427
Tripp, D. A., 451, 452
Trivero, P., 508
Truran, J. W., 389
Trussoni, E., 187
Tsao, C. H., 306, 423
Tsuji, T., 265, 269
Tsunemi, H., 234
Tsytovitch, V. N., 296
Tuchman, Y., 271, 278, 280
Tucker, K. D., 251, 407
Tucker, W., 233
Tucker, W. H., 445, 478
Tuggle, R. S., 18, 20, 22, 38
Tümer, T., 314
Tuohy, I. R., 234, 387
Turland, B. D., 194, 195, 198, 203, 204, 332
Turner, B. E., 252, 265, 273, 275, 278, 282, 283, 415
Turner, E. L., 329
Turnshek, D. A., 337
Twigg, L. W., 139
Tyson, J. A., 193, 495

U

Ulfbeck, O., 489, 519
Ulmschneider, P., 440, 441, 446, 447, 449, 455, 458-61, 481, 482
Ulrich, M.-H., 178, 189, 190, 325, 326, 328, 344
Ulrich, R. K., 142, 159, 160, 447, 476
Upgren, A. R., 146
Usher, P. D., 325, 327, 340

V

Vaiana, G. S., 445, 447, 478
Valentijn, E. A., 173, 175-77, 179, 189, 190, 210, 211
Vallée, J. P., 174, 187, 189, 190, 325, 327
Valtonen, M. J., 165, 191, 193, 194, 205
van Altena, W. F., 22, 146
van Ardenne, A., 194-96
van Breugel, W. J. M., 173, 174, 176, 188-90, 198, 201-3, 209
van de Kamp, P., 146, 148, 150, 151
van den Bergh, S., 21, 28, 203, 209, 229, 241, 419
van den Bos, W. H., 147
Vanden Bout, P. A., 265, 272, 274
Van den Heuvel, E. P. J., 383
van der Hucht, K. A., 279, 447, 450, 473-75
van der Kruit, P. C., 165, 169, 177, 190, 313
van der Laan, H., 169, 173, 174, 177, 186, 187, 190
Van Hoosier, M. E., 445, 451, 452, 456, 471
Van Horn, H. M., 364, 367, 373, 375, 390, 391, 396
van Rijsbergen, R., 128
Vapillon, L., 49, 58
Vardya, M. S., 265
Vasilevskis, S., 146
Vasyliunas, V. M., 225
Vauclair, G., 369, 377, 384, 385, 387-90
Vauclair, S., 377, 384, 385, 387, 389, 390
Veeder, G. J., 44, 66, 71, 131, 146, 149, 152
Vemury, S. K., 25
Verma, R. P., 291
Vernazza, J. E., 451, 452, 456, 482
Vernon, F. L., 492, 493
Vetesnik, M., 128
Vickers, D. G., 511, 543
Vidal-Madjar, A., 233
Vigotti, M., 325, 327
Vigroux, L., 421, 432
Visvanathan, N., 322, 324, 326, 330, 331, 335, 338, 339, 345, 346
Vitkevich, V. V., 325, 327
Vittone, A., 284

Vogt, R. E., 314, 422, 424-26
Völk, H. J., 294, 296, 304
Vonberg, D. D., 167
von Hoerner, S., 167
von Kap-herr, A., 173, 180, 203
Vrba, F. J., 326, 333, 339, 351, 355

W

Wacker, J. F., 90, 91, 104, 107
Waddington, C. J., 289, 309, 310
Wade, C. M., 169, 171, 197
Waggett, P. C., 198
Wagner, C. E., 230, 231
Walborn, N. R., 138
Walker, G. A. H., 153
Walker, M. F., 325
Walker, R., 365
Walker, R. C., 274, 277, 327, 349
Walker, R. L., 130
Wall, J. V., 324, 325, 327
Wallace, L., 49, 52, 53, 55
Wallerstein, G., 233, 242, 270, 271, 284
Walmsley, C. M., 407, 409
Walter, F. M., 477, 478
Wampler, E. J., 324, 326, 327, 330, 334, 342
Wanner, J. F., 151
WANNIER, P. G., 399-437; 264-66, 271, 276, 278, 280, 405, 407, 410, 411, 413, 415, 417, 430, 432
Ward, W. R., 84, 85, 89
Wardle, J. F. C., 200, 324, 325, 327, 341, 342, 349
Warner, B., 378, 446
Warner, J. W., 326, 333, 339, 340
Warner, P. J., 198
Warren, P. R., 21, 37
Warwick, R. S., 179
Wasserburg, G. J., 79, 435
Wasson, J. T., 105
Watkinson, A., 172, 193
Watson, A. A., 316
Watson, W. D., 245, 247, 249, 402, 403
Wdowczyk, J., 311
Weast, G. J., 364
Weaver, R., 220, 221, 232
Webb, D. F., 418
Webber, J. C., 277
Webber, W. R., 306, 309, 311, 425, 426
Webster, A., 267, 313
Weedman, D. W., 341
Wefel, J. P., 425
Wegner, G., 367, 369-71, 376, 382
Wehinger, P. A., 203
Wehrse, R., 371, 372, 376
Weibel, E. S., 230
Weidemann, V., 364, 368, 369, 377, 380, 382, 383, 392
Weidenbeck, M. E., 424, 425
Weidenschilling, S. J., 83, 85, 89, 100, 106, 107
Weigert, A., 18
Weiler, E. J., 450, 459, 462, 473, 477, 479
Weiler, K. W., 167, 207, 325, 326
Weinberg, S., 540
Weinberger, D., 274
Weisberg, J. M., 477
Weiss, E. W., 156
WEISS, R., 489-535; 496, 500, 502, 505, 508, 517, 522-24, 527, 543
Weiss, W. W., 19
Welch, W. J., 188, 194, 195, 203, 492, 493
Wellington, K. J., 175, 190, 198, 204
Wells, D. C., 209
Wendker, H. J., 269
Wentzel, D. G., 226, 292, 294, 301, 312, 483
Werner, M. W., 268, 273, 278, 280
Wesemael, F., 367, 373, 389, 390
Wesselink, A. J., 16
Wesselius, P., 371, 372
West, F. R., 144
Westbrook, W. E., 268, 275
Westergaard, N. J., 307, 309
Westphal, J. A., 209, 212, 272, 333
WETHERILL, G. W., 77-113; 79, 89, 94, 96-102, 104, 105
Weymann, R., 543, 556-58
Weymann, R. J., 269, 270, 272, 278, 337
Wheeler, J. C., 267, 282, 381
Whipple, F. L., 106
Whitcomb, S. E., 505
White, C., 322
White, N. E., 479
White, O. R., 445, 462, 471, 480
White, S. D. M., 553, 554
Whiteoak, J. B., 187, 188, 325, 327, 346, 407, 409, 411
Whitford, A. E., 136, 139
Whiting, D. L., 273, 278, 280
Whitney, A. R., 327, 353
Whittaker, A. G., 267
Wickramasinghe, D. T., 369, 371-73, 376, 377, 386, 388, 393
Wickramasinghe, N. C., 267
Wielebinski, R., 173, 180, 203, 313, 551
Wielen, R., 147
Wiita, P. J., 170
Wilcken, C. K., 128
Wildt, R., 55, 60
Wilkes, C. T., 190
Wilkes, R. J., 310
Wilkins, D. R., 450
Wilkinson, A., 325
Wilkinson, D. T., 492-94, 521-24, 526, 528, 529, 548
Wilkinson, P. N., 168, 172, 181, 195-97, 334
Williamon, R. M., 128
Williams, I. P., 82
Williams, J. G., 105
Williams, P. J. S., 325, 327
Williams, R., 219
Williams, R. E., 324, 337
Williams, W. L., 324
Williamson, K. D., 508
Williamson, R. M., 326, 333, 339, 351, 355
Willis, A. G., 165, 172, 180, 189, 190, 192, 198-200, 202, 204, 205, 210, 346
Willner, S. P., 267, 275, 283, 284
Wills, B. J., 324-27, 331, 334
Wills, D., 166, 324-27, 331, 334
Wills, R. D., 314, 315
Willson, L. A., 271, 278, 281
Wilson, A. S., 174, 180, 189, 194, 198
Wilson, C. P., 209, 212, 333
Wilson, J. G., 316
Wilson, O. C., 451, 462, 466, 480
Wilson, P. R., 471
Wilson, R., 446, 457
Wilson, R. E., 135, 139, 156
Wilson, R. W., 402, 404, 405, 407, 410, 411, 413, 415, 492-94, 521-23, 530, 537, 548
Wilson, T. L., 407, 409, 413, 429, 503
Wilson, W. J. F., 17, 34
Windram, M. D., 169, 176
Wing, R. F., 264, 446-48, 450
Winnberg, A., 274, 276
Winston, R., 505
Wirtanen, C. A., 326, 335, 338, 340
Wisniewski, W. Z., 127, 144, 149, 156, 326, 333, 339, 351, 447, 455
Witebsky, C., 503

Withbroe, G. L., 440, 442, 445, 483
Witteborn, F. C., 43, 66
Wittels, J. J., 327, 353
Witzel, A., 195, 325, 327
Wojslaw, R. S., 274
Wolf, G. W., 447
Wolf, S. C., 463
Wolfendale, A. W., 311, 312, 316
Wolff, R. S., 237, 241, 411, 414
Wollman, E. R., 49, 266, 417
Wolstencroft, R. D., 352
Woltjer, L., 208, 349
Wood, D. B., 122, 129, 130, 132
Wood, F. B., 115, 124, 126-28, 130, 132, 136-39, 142, 156
Wood, H. J., 19
Wood, J. A., 92
Wood, P. R., 271, 278, 280-83, 382
Woodgate, B. E., 234
Woodman, J. H., 56, 60
Woodward, P. R., 80, 251
Woody, D., 543
Woody, D. P., 496, 498, 500, 512, 516
Wooley, R., 16
Woolf, N. J., 279, 345, 352
Wootten, A., 402
Wootten, H. A., 251, 265
Worden, S. P., 442, 450, 452, 455, 456, 460, 461, 466, 472, 474, 481
Worley, C. E., 146-51, 153
Worth, M. D., 146, 149-51
Wray, J. D., 375
Wright, A. E., 325
Wright, K. O., 143, 145
Wright, M. C. H., 167, 194, 195
Wrixon, G., 492, 493
Wyatt, S. P., 268, 271, 280, 281, 389
Wyckoff, S., 203, 264
Wyller, A. A., 150
Wynn-Williams, C. G., 275
Wyse, A. B., 160

Y

Yabushita, S., 202
Yee, H. K. C., 207
Yen, J. L., 168
Yngvesson, S., 281
York, D. G., 233, 367, 402, 429
Yorka, S. B., 264
Young, A., 478
Young, J. S., 309
Young, P. J., 209, 212, 333
Younger, F., 133, 139
Yuan, C., 251
Yushak, S. M., 311

Z

Zahn, J. P., 479
Zamorani, G., 327, 346
Zaninetti, L., 187
Zappala, R. R., 272
Zarnecki, J. C., 234
Zéau, Y., 49, 55, 58
Zebergs, V., 138, 145
ZEL'DOVICH, Ya. B., 537-60; 222, 224, 227, 489, 538, 540-43, 545, 547, 548, 551, 554, 555, 557-59
Zellner, B. H., 275
Ziglina, I. N., 101, 105
Zimmerman, B. A., 427
Zipse, J. E., 310, 311
Zirin, H., 450
Zirker, J. B., 465, 466, 483
Zissell, R., 127
Zotov, N. V., 326
ZUCKERMAN, B., 263-88; 264-66, 271, 273, 275, 278, 279, 282-84, 415
Zverev, Yu. K., 194
Zvyagina, Y. V., 91
Zwaan, C., 483
Zweibel, E. G., 302
Zwicky, F., 341

SUBJECT INDEX

A

Abundance ratios
  in late-type giant stars, 264–66, 277
Accretion disk, 79
Active extragalactic objects, 321–356
  absorption lines in, 323, 331, 337
  accretion disks in, 350–51, 353, 355
  Balmer lines in, 331, 336
  black holes in, 333, 351, 355
  bremsstrahlung in, 350–51
  compact cores of, 322–23, 329, 332, 334–36, 346, 352
  continuum radiation from, 321, 323, 329, 331, 337, 340, 345, 352, 354
  double-lobe radio emission from, 331, 334–35, 339, 346, 349, 351–52, 354–55
  dust grains in, 322, 337, 341, 343–45, 347, 350–52, 356
  ejection of matter in, 332
  emission lines in, 322, 330–31, 334, 336, 340–43, 345, 354–55
  energy release in, 321, 346–47, 351, 353, 355–56
  forbidden-line emission from, 329, 331
  infrared emission from, 322, 333–37, 339, 341, 344–46, 348, 350, 353, 355–56
  jets in, 321–22, 332, 335, 338, 349, 351–55
  luminosities of, 329–30, 338, 341, 343, 351, 353–55
  magnetic field in, 348–50, 352
  models of, 349–56
  nonthermal emission from, 322, 341, 345–46, 350
  optical emission from, 321–23, 329, 331–32, 334–35, 337, 339, 342, 344–46, 348, 350, 352–56
  polarization of, 321–56
    dilution of, 331, 333–34, 346–47, 354
    models of, 322, 347, 350–55
    position angle of, 323–27, 329, 331–33, 335–39, 342, 344–46, 354
    variability of, 323, 329, 331–34, 336–39, 342, 346–47, 350
    wavelength dependence, 335, 337, 339–40, 344–46
  radio emission from, 322–23, 329, 331–32, 334–36, 341–44, 346–50, 352–54, 356
  redshifts of, 323–37, 329, 331, 333–36, 342–43, 345, 354–55
  scattering of radiation in, 322, 337, 343–45, 347, 350–52, 354
  spectra of, 321, 323–27, 329, 331–36, 340–43, 346–48, 350–54, 356
  superluminal expansion in, 334, 342, 347, 349, 352–53
  supermassive objects in, 351
  synchrotron radiation in, 332, 344, 346–50, 352
  thermal emission in, 322, 344–45, 350, 353
  variability of, 321, 329, 332–35, 338–42, 345–49, 351, 353, 355–56
  visual magnitudes of, 323–27, 334, 336, 340, 346
  X-ray emission from, 337, 341, 343, 346, 350, 356
Albedos, planetary, 63–64
Alfvén Mach number, 225, 227–28
Alfvén velocity, 186, 227, 230, 292, 295, 297, 301, 308–9
Alfvén waves, 256, 270, 292, 295, 297
Algol-type binary systems, 155, 157–58
Alpha Herculis, 269, 277, 279
Ambipolar diffusion, 303
Angular resolution, 167–68
Antennas, 491, 494–96, 507, 524
Antenna temperature, 491–95, 503–7, 522–23, 529
AO 0235+164, 333–34, 338–39, 342, 350, 352, 354
AP Librae, 338, 342–43
Arcturus, 448, 450, 452, 472–73, 476–80
Asteroids, 78, 89, 105
  composition of, 69–70, 72
  observations of, 43–44
  surfaces of, 43, 45, 66–69, 71–73
Astrophysics, development of, 1–13
Atmospheric interference
  with background radiation, 490–91, 497–502, 507, 509, 512, 514, 516–17, 521, 524, 531
Atmospheric transmission windows, 47–48, 51, 57–58, 61–63

B

Balmer lines, 232–33, 238, 264, 331, 336, 365–66, 369–72, 375, 377, 446, 449–51, 456, 463, 476, 481–82
Bandwidth, 51, 53, 70, 491
Beta Draconis, 468–69, 475
Betelgeuse, 265–66, 268–69, 273, 275, 449, 474–75
Big bang, 399, 414, 427, 489
Binary stars
  Algol-type systems, 155, 157–58
  cannibalism in, 365
  chromospheres of, 476–77
  detached evolved systems, 121, 135, 140–43, 159
  detached main-sequence eclipsing systems, 121–22, 124–31, 133, 155, 157, 159–60, 365
  double-lined eclipsing, 142–43
  eclipsing, 115–16, 119–31, 140, 142, 153–59
  flux ratios in, 132
  light curves of, 116, 121–23, 140, 142
  light ratios in, 122–23, 133
  line intensities in, 123–24, 134
  mass ratios in, 142, 147–49, 155
  OB eclipsing systems, 121, 133–38
  orbits of, 122, 135, 146–47
    inclination of, 132, 140–41, 143–155

radial velocities of, 122, 142, 145, 153, 155, 158
reflection of light in, 122, 155, 158
resolved spectroscopic, 121, 143–44
semidetached eclipsing, 121, 135, 140, 154–60
spectroscopic, 116, 142–44
tidal distortion in, 122
uncertainties in deriving physical parameters of, 124–25, 134–35, 146–49, 152–55, 159
visual, 115–16, 121, 146–54, 159–60
Blackbody spectrum, 491, 497–98, 500, 514, 516, 519, 527, 545–46
Black holes, 212–13, 333, 351, 355, 542, 548
Blazars, 321–23, 333, 337–38, 341–43, 345–48, 350, 353
BL Lacertae, 329, 336, 338–40, 342–43
BL Lacertae objects, 207, 321–22, 332–33, 338–42, 350, 353–54
Bose-Einstein spectra, 546–47, 549, 556–57, 559
Bremsstrahlung, 313–14, 350–51, 387, 540, 547, 550, 553–54
Brightness temperature, 342, 347–50, 352
B2 1308+326, 333, 338–39, 355
Burnham's nebula, 239–40, 242
BY Draconis stars, 476–77, 479–81

C

Capella, 142, 145, 160, 448, 454, 457, 461
Carbonaceous chondrites, 69, 72
Carbyne, 267
Cassiopeia A, 229, 233, 241, 257, 418–19, 433
Cayrel effect, 441, 444
Centaurus A, 168, 172, 185, 195, 197, 203, 209
Cepheid instability strip
see Cepheid variable stars, pulsation instability strip for
Cepheid variable stars, 15–39
beat, 16–20, 27, 36–37
binary-system, 15
blue loops in evolution of, 18, 20, 27, 38
bolometric corrections for, 38–39
bump, 17–20, 26–27, 37
bump phases of, 26
calibrating, 16, 22, 37
Carson opacities in, 20, 22, 25
Christy echoes in, 25–26
color effect in, 38–39
color index of, 22, 38–39
colors of, 21
convection zones in, 27–28
density gradient in, 18–19, 27
double-mode, 16, 18, 26–29, 36–37
envelope structure of, 19, 22, 28, 37
first overtone mode in, 27, 29
fundamental mode in, 16, 19, 26–27, 29
heavy-element content of, 18
helium content of surface layers of, 18–20, 22, 27–29, 34, 36–38
light curve bumps in, 15–16, 18, 25–26, 35
light curve phase in, 16, 25
Los Alamos opacities in, 20, 25
luminosities of, 15–16, 20, 23–24, 30–33, 36–39
magnetic field in, 19–20, 22, 27–29
mass anomaly in, 15–20, 25, 28–29, 34, 37–38
masses of, 15–39
beat, 16, 21, 36, 38
bump, 15, 21-22, 26, 36, 38
double-mode, 27–29
evolution-theory, 15, 17–18, 20–24, 27–29, 35–36, 38
pulsation-theory, 15, 17–18, 21–24, 28, 35–36
Wesselink-radius, 17, 21, 30–33, 34–35, 37
mass loss in, 17–18, 21, 39
mass-luminosity relation for, 18, 21–22
membership in clusters and associations, 20
mode coupling in, 27
models of, 18, 27
homogeneous, 22, 28–29, 34–36, 38
inhomogeneous, 22, 29, 34–36, 38
mode switching in, 29
multiple-mode behavior of, 29, 35
nonradial modes in, 19–20
period-color relations, 38–39
period-luminosity-color relations, 16, 22, 37–39
period–mean density relations, 16–17, 21, 26
period-radius relations, 37, 39
periods of, 15–16, 19, 21, 23–24, 26–33, 37, 39
ratios of, 16–18, 20, 26–29, 37
photometry of, 16, 21, 28
pulsational instability in, 19
pulsational instability strip for, 18, 20, 29, 34, 38
blue edge, 22, 39
red edge, 29, 39
width of, 27, 38
pulsation theory for, 25–26
radii of, 16, 23, 27–28, 30–34, 36–37
resonances in, 26–28
rotation of, 18
second overtone mode in, 16, 26
surface temperatures of, 15, 17–18, 21–25, 28–31, 35, 37–39
triple-mode, 19, 27, 29
turbulence in, 16
velocity curve bumps in, 15, 25–26, 35
Wesselink radii of, 16, 28, 36–37
Ceres, 69
Charge exchange, 227, 233
Chromospheres of stars, 439–83
acoustic waves in, 441, 447, 458–62, 464, 482–83
asymmetries in spectra of, 471–75
in close binary systems, 476–80
continuum radiation in, 440–42, 447, 460, 467, 482
definition of, 440–42, 444
dissipation of energy in, 441–42, 445, 483
EUV radiation from, 443, 445
extent of, 440
flow patterns in, 470–75, 479, 483
heating of, 439–45, 455, 458–60, 464–66, 472, 478, 482–83
hydrodynamic waves in, 458
infrared emission from, 446, 460, 471
inhomogeneities in, 451, 461–62

magnetic fields in, 442, 445, 460–61, 476–83
mass column density in, 456, 464, 469–70, 477
models of, 439, 441, 449, 451, 454–55, 457–58, 460–61, 466, 468, 477, 482
radiative equilibrium in, 441, 455
radiative loss from, 442, 444–45, 455, 458–62, 481–83
spectral lines of, 439–42, 444–51, 454–78, 480–83
temperatures in, 441–42, 450–53, 456, 458–61, 468, 470, 474, 478, 483
gradient of, 442, 454–55
thermal conduction in, 442–43, 445
turbulence in, 455, 464–65, 468–71
ultraviolet radiation from, 443, 446–47, 460, 479
variability in, 480–81
velocities in, 470, 475, 479
winds in, 444–45, 447, 474–76
X-rays from, 442–43, 445, 447–48, 479
Circumstellar matter, 78, 263–66, 268–71, 273, 275–82, 284, 416–17, 429, 473–75
CIT 6, 264, 266, 279
Comets
formation of, 78
Compton catastrophe, 347, 349
Compton scattering, 313, 347, 350, 352, 538, 540, 542, 544–45, 547–51, 556, 558–59
Condensation temperature, 269
Copernicus satellite, 400, 446–47, 450, 459, 463, 473
COS-B, 289, 314
Cosmic Background Explorer, 531–33
Cosmic background radiation, 489–533, 537–59
anisotropy of, 537–38, 552–53
large-scale, 490, 495, 519–30, 533
small-scale, 519, 537–38
atmospheric interference with, 490–91, 497–502, 507, 509, 512, 514, 516–17, 521, 524, 531
brightness temperature of, 540–53, 554, 557–58
discovery of, 489, 537
isotropy of, 489–91, 519–21, 527, 530
measurements of, 489–533, 538, 547–48, 550–53
high-frequency, 494, 496–98, 500, 502–3, 507–18, 527, 531, 533
low-frequency, 490, 495–97, 500, 503, 506–7, 533
polarization, 489–91, 510–13, 530–31
polarization of, 489–91, 510–13, 530–31, 537, 555–56
spectrum of, 489–96, 503, 507–8, 510, 514–18, 520–21, 533, 537–38, 540–59
distortions of, 489, 515–16, 540–41, 543–50, 555
temperature of, 493, 508–9, 515–16, 518–20, 529
Cosmic rays, 225–26, 242, 244, 255, 289–316, 422, 424, 426
abundances in, 290, 301, 305, 309–10, 399–400, 416, 422–25, 427, 433–34
acceleration of, 291–92, 307, 423
adiabatic losses in, 308
age of, 290, 307, 309, 311
anisotropy of, 389–90, 299, 312, 316
antiprotons in, 311
bubbles of, 299–302
closed model of, 290
collisions of, 293, 296, 297
composition of, 290, 304–9, 311
elemental, 289, 305–6, 308
isotopic, 289, 309
compound diffusion of, 298–99
confinement of, 289, 291–92, 295, 299, 308–9, 316
convection of, 293, 301, 308
Coulomb interactions of, 305, 308
diffusion of, 292–96, 298, 307–9, 312–13
diffusion model of, 290–91, 299–300, 306, 309–11
distribution of, 289, 304, 316
dynamical halo model of, 290, 308–9
electrons in, 289–90, 310–11, 313–14
escape of, 290, 305, 307–9
exclusion from interstellar clouds, 291
extragalactic model, 291
gyration radius of, 291–92, 307
injection spectrum of, 306, 311
interactions with interstellar matter, 289–90, 310–11, 313
intergalactic, 542, 544
leaky-box model, 290, 293, 297, 300, 305–6, 309, 311–12
mean amount of matter traversed, 294, 298, 300, 304–7
mean density of matter traversed, 301
measurements of, 289, 305–6, 311, 316
momentum transfer by, 300–1
nested leaky-box model, 290, 300, 306, 311
number density of, 292, 294, 315
pi mesons in, 313
pitch angle of, 292, 294, 296, 298, 300
positrons in, 289, 311
pressure of, 300, 302–3
primary nuclei in, 290, 305–6
propagation of, 290, 292, 295, 298, 301, 305, 307–9, 312, 422, 424, 426
proton spectrum in, 306, 310
radioactive isotopes in, 310
relativistic, 289, 300, 307, 313
secondary nuclei in, 290, 305–6, 310
solar modulation of, 305, 309, 314
sources of, 289–91, 302, 306
spallation reactions in, 305, 308, 422–24, 426–27
spectrum of, 289–90, 304–7, 314, 316
streaming of, 294–95, 312
transport of, 298
ultraheavy nuclei in, 289
very high energy, 316
Crab nebula, 10, 332, 347
CRL 618, 275, 278, 283
Cross sections, nuclear, 305, 308
Cyclotron radiation, 349
Cygnus A, 168–71, 179–80, 195, 208, 213
Cygnus Loop, 233–34, 240–42

D

Deceleration parameter, 538
Degenerate electron gas, 363
Delta Scuti stars, 17, 378, 446, 475
Diffuse galactic background, 332
Diffusion coefficient, 291, 293, 296, 298, 307–8, 313
DI Herculis, 134–35, 138
Dione, 66–67, 70
Doppler cores of spectral lines, 464, 466–68
Doppler effect, 544–45, 550, 554, 556
Doppler redistribution, 465–68
Drift velocity, 292, 303
Dust grains, 77–78, 84–85, 107, 222, 238, 240, 242, 250, 253, 264–273, 275–80, 505–6, 527, 532–33, 541, 550
Dwarf novae, 115

E

Earth
  bow shock of, 228–29, 231
  formation of, 88, 99, 101, 104–5, 108
Einstein X-ray Observatory, 195, 212, 229, 234
Envelopes of late-type stars, 263–84
Epsilon Eridani, 448, 456–57
EQ Virginis, 461, 479–80
Escape velocity, 86–87, 91–94
Extended radio emission, 165–213
Extensive air showers, 316
Extragalactic radio sources, 165–213
  structure of, 165–71, 177–78, 189, 206

F

Faraday polarization, 349
Faraday rotation, 332–33, 349–50
Fermi acceleration, 255–57, 351
Flux-freezing conditions, 224
Fokker-Planck equation, 107
Formation of planets
  see Giant planets, formation of; Terrestrial planets, formation of
Fornax A, 173, 194, 209
Fourier transform spectrometer, 510, 532
Free-fall time, 302
Free-free emission, 503, 504
  See also Bremsstrahlung
FU Orionis stars, 12

G

Galactic ring, 408–9, 412–14, 431–32, 434
Galactic wind, 300–1
Galaxies
  clusters of, 166, 169, 173, 175, 190, 192, 209–11, 538, 544–45, 550–55
  halos of, 175–76
  compact radio cores of, 169–72, 174, 193–97, 200, 202–3, 206–7, 211
  elemental and isotopic abundance ratios in, 406, 432, 435
  elliptical, 165, 170, 173, 194, 208, 329, 336, 343, 355
  evolution of, 1, 7, 10–12
  formation of, 1, 7, 10, 12, 540, 544
  halos of, 322
  jets in, 321–22, 332, 335, 338, 349, 351–55
  nuclei of, 10–11, 169, 181, 194–95, 206, 211–13, 257–58, 321, 323, 332–34, 341, 352, 354, 542, 554
  optical observations of, 170, 172, 182–83, 193, 202–11
  radio emission from, 165–213
  see also Radio galaxies
  Seyfert
  see Seyfert galaxies
  spiral, 165, 194
  spiral arms of, 313
  S0, 194
Galilean satellites, 43, 66–67, 72
Gamma rays, 289, 304, 312–15
Giant planets
  atmospheres of, 43–48, 51–65, 67
  chemical composition of, 44, 47, 53–57, 60–63, 65, 72, 105–6
  evolution of, 44–45
  formation of, 78, 83, 88, 89, 106
  spectra of, 45–46, 49–53, 57–65
Gravitational focusing, 92
Gravitational perturbation, 92–93, 95–97, 100, 103–4
Gravitational radiation, 520

H

H II regions, 10, 219–21, 238–39, 243–44, 252, 296, 389, 419–20, 435, 503–4, 533
HEAO satellites, 229, 367, 387, 447–48, 554
Heavy elements
  production of, 399–400
H-H objects, 238–40, 242–43
Hill sphere, 108
H-R diagram, 18, 277, 378, 383, 446, 448–49, 473
Hubble constant, 323, 330, 538, 554
Hubble time, 543, 547
Hyades, 382–83
Hydromagnetic waves, 226, 292, 294–96, 304, 308
Hydrostatic equilibrium, 302

I

Iapetus, 66–67, 70
Ices, 67, 72
Infrared excess, 78
Infrared spectroscopic observations, 43–74
Instability, 294, 303–3
Intercloud medium, 293–94, 297, 304, 389
Interferometry, 167–69, 510–14, 517, 532
Intergalactic medium, 169, 177–79, 190–91, 193, 197, 204, 211, 540, 550–54
  cooling of, 547, 557
  heating of, 540, 542–44, 552, 557
  ionization of, 540–42
Interplanetary medium, 87, 105, 295
Interstellar medium, 78, 155, 200, 399–435
  absorption and emission in, 4, 400–9, 412–19, 421, 429, 451, 472, 506
  abundance gradients in, 406, 408–9, 415–16, 419–21, 431–32, 435
  abundance variations in, 410, 412, 414, 427, 432, 435
  chemical fractionation in, 400–6, 410, 412, 416–17
  chemical reactions in, 400–2, 406, 414, 417
  clouds in, 399–405, 409–17, 421, 432–55
  collisions of, 221, 235, 252–53, 258

CNO elements in, 401–3, 406–24, 427–35
cooling rate of, 298
dense (molecular) clouds in, 399–405, 409–17, 421, 432–55
depletion in, 400, 418, 428, 413
deuterium in, 401–3, 414–16, 427–29
diffuse radio emission from, 503–4, 521, 524
enrichment of, 400, 416, 418, 421, 430
evolution of, 399, 406, 416, 427–28, 430, 434–35
FUV radiation in, 237, 244, 247, 252
hydrogen in, 293, 305, 313–15
iron-group elements in, 422–24, 426, 433, 435
isotope abundance ratios in, 399–400, 403–15, 417–20, 422–35
magnetic fields in, 221, 223–28, 230, 232, 240, 254–55, 503
masers in, 252–53
molecules in, 400–1, 403–4
neon in, 424, 433–34
nuclear abundances in, 399–435
  models of, 404, 427, 432
  uncertainties in, 409–10, 414, 419, 422, 432, 435
polarization in, 329, 337, 346, 352
radiation field in, 264, 275
reddening by, 21, 38
shock waves in, 219–258
silicon and sulfur in, 401, 406–14, 417–20, 423–25, 431–35
tunnels in, 304
ultraviolet radiation in, 234, 247, 403
Invariance principles, 1–4, 11–12
Inverse problems, 1, 5–7, 12
Io, 66, 73
Ion-cyclotron resonance, 295
Ion gyroradius, 230
Ionization, 224, 244, 297
IRC+10216, 264–66, 268, 271–72, 275–76, 280–82, 416–17, 419, 431
IRC+10420, 274, 276–77
IUE satellite, 269, 369, 376, 385, 400, 445–51, 457, 459, 463, 477–78

J

Jacobi parameter, 104
Jeans criterion, 81–82, 84
Jupiter
  formation of, 83, 88–89, 105–6
  infrared observations of, 43–46, 48–58, 60–61, 65, 73
  vertical convection in, 54–55, 61

K

Kelvin-Helmholtz instability, 204
Keplerian motion, 5, 90, 92, 94–95, 99, 106
Kolmogorov spectrum, 296–97
Kompaneets equation, 556, 558
Kraichan spectrum, 297
Kuiper Airborne Observatory, 47, 51, 58, 67, 74

L

Lambda Andromedae, 454, 477, 479
Landau damping, 295–96
Large Magellanic Cloud, 234, 240–41, 243
Larmor frequency, 292
Larmor radius, 228
Late-type stars, 263–84, 446, 466, 473
  carbon in atmospheres of, 265–55
  chemical composition of, 263–65
  chromospheres of, 268–71
  freeze-out model of, 265
  infrared emission from, 263, 265–69, 271–77, 279–80, 282, 284
  isotope abundances in, 263, 266–67
  microwave and radio emission from, 263, 265–66, 269, 271, 275–276, 279–80, 282
  optical observations of, 269–70, 279, 284
  physical properties of, 263
  spectra of, 263–64
Liouville theorem, 304
Lunar occultations, 143–44, 167, 272, 275
Lyman continuum, 2, 236, 444, 451
Lyman lines, 2, 444, 449, 451, 456–57, 463, 474, 481, 541–42

M

M 31, 22
M 87, 168, 173, 179, 186, 194–95, 197, 201, 203, 206, 212, 258, 322, 332–33
Mkn 180, 342–43
Mkn 421, 343, 353
Mkn 501, 338, 341, 343
Mach number, 221, 224, 229–32
Magellanic Clouds, 22
  see also Large Magellanic Cloud; Small Magellanic Cloud
Magnetic field
  in active extragalactic objects, 348–50, 352
  in chromospheres of stars, 442, 445, 460–61, 476–83
  extragalactic, 299
  in interstellar medium, 221, 223–28, 230, 232, 240, 254–55, 289, 291–94, 297, 299, 303–4, 313, 422, 503
  fluctuations of, 292, 295, 298
  inhomogeneities in, 292, 298–99, 304, 312–13
  lines of force, 225, 298–300, 312
  in protoplanets, 80–81, 86
  around stars, 275–76
  turbulence of, 298–99
Magnetic mirrors, 255–56
Magnetoacoustic waves, 297
Magnetosonic waves, 296
Main-sequence stars
  see Stars, main-sequence
Markarian galaxies, 341
Mars
  formation of, 88, 101, 105
  polar caps of, 67
Masers
  circumstellar, 263, 274–84
  interstellar, 252–53
Maunder minima, 481
Maxwellian velocity distribution, 95, 22, 227, 229, 550–51, 556
Maxwell's equations, 223
Mercury
  formation of, 101, 105, 107
Meteorites, 70, 73, 79, 105, 110, 400, 424, 435

Michelson interferometry, 143, 510–14, 517, 532
Microturbulence, 302
Microwave background radiation
  see Cosmic background radiation
Milky Way galaxy
  center of, 311, 408, 412–14, 428, 431–32, 434
  corona of, 295, 197, 300–1
  disk of, 291, 293–94, 297, 302, 307–8, 313–14, 408, 420, 432, 504–6, 549
  halo of, 299, 309, 313–14, 316, 421
Minerals
  in planets, satellites, and asteroids, 45, 67, 69, 72
Mira-type stars, 264, 268, 272, 276, 278–79, 281–84
Molecular clouds, 78, 228, 244, 250, 265, 268, 280, 399–405, 409–17, 421, 432–33, 435
Molecules
  in atmospheres of giant planets and their satellites, 44–48, 51–63, 65, 67
  dissociation of, 244–47
  formation of, 221, 244–47, 252
Moon
  formation of, 105, 109
Multiple Mirror Telescope, 379

N

N 49, 239, 241–42
Neptune, 43–44, 46, 61, 63–65
Neutron stars, 363, 383, 426
NGC 315, 179, 201, 204–5
NGC 1068, 343–45, 352
NGC 1265, 173, 175, 191, 198, 204–5, 209
NGC 1275, 195, 197, 209, 258, 323, 329, 338, 342–44, 354–55
NGC 4151, 343-45
NGC 5128, 195, 197, 209
NGC 6251, 168, 195–96, 198, 204, 206
NGC 7027, 266, 278, 283
Nonthermal emission, 368
Novae, 115, 427, 430

O

OB stars, 78
OJ 287, 337–39, 342, 354
Orion nebula, 78, 239, 250, 258, 413, 503
OSO satellites, 289, 314, 462

P

Parker instability, 302–3
Partial redistribution radiative transfer, 451, 455, 465–66, 475
Perseus cluster, 173, 176, 191–92, 197, 323
PHL 5200, 322, 337, 341, 346
Photodesorption, 238
Photodissociation, 264, 275
Photoionization, 219, 232, 235, 237–39, 242–44, 257
Photolysis, 61
Photon diffusion, 545, 547
PKS 0521–36, 329, 331, 343, 354–55
Plages, 454–56, 460–61, 466, 477–78, 482
Planck spectrum, 497, 515, 520, 527, 545–46
Planetary embryos, 87, 100–1, 104–5, 108–9
Planetary nebulae, 8–9, 238–39, 266–68, 275–84, 381–83, 400, 416–21, 427, 429
Planetary nebula stars, 383–84
Planetesimals, 72, 88–89, 92, 99, 105–10
  density of, 81, 98
  mass of, 81–86, 90–94, 98, 100, 107–10
  number of, 101–3
  orbital semimajor axes of, 95, 97, 99–104
  size of, 83, 91, 94, 96, 101, 103, 106–7, 110
Planets
  albedos of, 63–64
  giant
    see Giant planets
  photometry of, 53, 67, 71
  temperatures of, 44–45, 47, 53–54, 57, 61
  terrestrial
    see Terrestrial planets
Plasma instabilities, 221, 230–31, 257
Plasma oscillations, 295
Plasma turbulence, 219, 256–57
Plasmons, 169, 193, 200, 211
Pleiades, 7, 382
Pluto
  infrared observations of, 44, 67, 72
Polarization, 268–69, 275–76, 329, 337, 346, 352
Pre-planetary nebulae, 282–84
Primeval fireball, 489, 519, 537
Procyon, 117, 119–20, 153, 365, 367–68
Protoplanets, 80, 82–83, 86, 92
  giant gaseous, 80, 89
  rotation of, 81
Protosolar nebula, 406, 412, 435
Protostars, 228
Protostellar nebulae, 267, 280
Protosun, 82–83
Pulsars, 115, 280, 383
Pulsation instability strip
  see Cepheid variable stars, pulsation instability strip for

Q

Quasars, 10–11, 165, 169, 171–72, 193–95, 198, 200, 203, 207–9, 235, 258, 321–22, 335–38, 340, 343, 346, 350–56, 540, 542
  see also RADIO SOURCES at end of Index

R

Radiation pressure, 244, 441, 474
Radiative transfer, 1–4, 11–12, 237, 249, 451, 455, 465–66, 475
Radio-continuum emission, 294, 313–14
Radio galaxies, 165–213, 321, 335, 354–55
  ages of, 186–87
  beaming of energy in, 170
  double sources in, 170–73, 193–94, 196, 198, 207, 331, 334–35, 339, 346, 349, 351–55
  dust lanes in, 209
  edge brightening in, 171–72, 177–81, 190, 200, 205, 209, 212
  edge darkening in, 172, 174, 179
  ejection of compact objects from, 193
  Faraday rotation in, 187–88, 203
  head-tail, 169, 173, 194
  hot spots in, 169, 171, 179, 181, 183, 189, 192, 212
  in situ acceleration in, 186–87
  jets in, 170, 172, 189, 196–98, 200–6, 212

linear size of, 180
lobes of, 169, 170, 181, 183, 192, 202, 211, 331, 334–35, 346, 349, 351–52, 354–55
magnetic fields in, 170, 182–83, 185–90, 192, 203–5
minimum energy condition in, 182–83, 186
models of, 170
morphology of, 166, 169–70, 177–78, 186, 200, 209–211
polarization of, 167, 170, 181, 187–90, 192–93, 197, 203–4, 209
source confinement in, 183–85, 190
spectra of, 171, 178, 183, 189, 192, 194–97, 203, 206, 212
synchrotron emission from, 177, 182, 185–87, 193, 202–3, 205
tailed, 173–78, 189–91, 198, 210–11
X-ray emission from, 185, 190, 197, 203, 211–12
See also RADIO SOURCES at end of Index
Radionuclides, 45, 72
Rankine-Hugoniot relations, 223
Rayleigh-Jeans spectrum, 490–91, 494–96, 537, 541, 543, 545–46, 549–51, 558
Rayleigh scattering, 63
Rayleigh-Taylor instability, 251, 254, 303
Receivers
radio, 491, 494, 496–97, 507, 509–10, 521, 524, 527, 530, 532–33
Red giant stars, 18
Relativistic bulk motion, 321, 334, 342, 349, 351–56
Resolution
spatial, 45, 53
spectral, 48–49, 52–53, 57–59, 62–63, 66–67, 71, 73
Resonant scattering, 237
Rhea, 66–67, 70
Roche density, 81
Roche limit, 84, 105
Roche lobe, 142, 137, 159
RR Lyrae stars, 26
RS CVn stars, 140, 447, 450, 456–57, 460–61, 476–79
RX Herculis, 124, 132–33

S

Safronov steady-state velocity, 92–96
SAS-2 satellite, 289, 314
Satellites
composition of, 67
infrared observations of, 43–46, 48, 66–67
surfaces of, 44–45, 66–68
Satellite systems, formation of, 78
Saturn
formation of, 83, 88–89, 105–6
infrared observations of, 43–44, 46, 48, 50–51, 57–65, 73
rings of, 67, 70
Scale height, 291, 294, 303
Scattering of light, 56, 62, 65, 268–9, 273, 275, 278
Scintillations, 166, 192, 296
Seyfert galaxies, 11, 194, 321–22, 340–46, 350, 352, 356
Shock front, 221, 223–24, 228, 237, 245, 254–55
Shock thickness, 227–28, 231
Shock waves
acceleration of particles in, 255–56
collision-dominated, 222, 251
collisionless, 222, 227–32
cooling behind, 226–27, 233, 236, 245–50
dissociative, 245–46, 248
excitation process in, 236
hydromagnetic, 224
infrared emission from, 235, 243–33, 248–50
interstellar, 219–58, 304–5, 307–8
jump conditions in, 219, 222–26, 229
laminar, 230
nondissociative, 248
nonradiative, 219, 226, 232–34, 241–253
post-shock relaxation layer in, 221–22, 226
precursor radiation in, 221–22, 235–37
preshock ionization in, 236, 240
propagation of, 219, 221, 233, 254
radiation from, 221, 225–26, 232, 235, 237–43, 248, 250–51, 253
radiative, 220, 226, 234–35, 241, 251, 253–54
radio emission from, 250–51
in stellar atmospheres, 264, 268, 271
stability of, 253–55
strength of, 221, 248
turbulent, 230
Silicates, 67, 72
Sirius, 120, 153, 363, 365, 367, 386–87
SIRTF, 74
Skylab, 375
Small Magellanic Cloud, 240–42
Solar circle, 314–15
Solar faculae, 483
Solar flares, 255, 257, 423–24, 442, 456
Solar nebula, 45, 57, 72, 77, 79–80, 82–83, 88–89, 105–6, 109–10
density in, 82
dust layer in, 83–85, 89, 107
gaseous, 80, 109–10
gas-free, 80, 89, 96, 98–100, 105, 107
temperature in, 83, 109
Solar wind, 232, 289, 308, 312, 424
Space Telescope, 213
Spectra
laboratory measurements of, 47, 56–57, 59–62, 67, 73
Spectral line formation, 57, 61–62
Spectral reflectance, 70, 72
Spica, 138, 145
Spinars, 351
Spiral density wave, 221, 251
Star clusters, 7–9, 365
Stars
abundance of elements in, 400
active-chromosphere, 461
ages of, 160, 480
AM CVn variables, 374
angular diameters of, 117, 120, 153, 269, 272, 276, 279, 284
associations of, 9–10
BEM flux scale for, 117, 119–20
binary
see Binary stars
birthrate function of, 380, 382–83, 394
blue helium, 18
bolometric corrections for, 116–120, 148, 159
carbon-rich, 264, 266–67, 272, 274–75, 280–82
Cepheid variable
see Cepheid variable stars

chromospheres of
see Chromospheres of stars
circumstellar envelopes of, 78, 263–66, 268–71, 273, 275–82, 284, 416–17, 429, 473–75
color excess of, 124, 126–31, 136–37, 139, 156
color index of, 117–21, 123–33, 136–39, 141–42, 144–45, 148–52, 156, 158, 474
composition of, 120, 125, 160, 439, 465, 480
C/O ratio in, 264, 282–83
coronae of, 268–71, 441–43, 445, 447–48, 457–58, 462, 474–75, 480, 483
degenerate
see White dwarf stars
Delta Scuti, 17, 378, 446, 475
disk population, 79, 120, 366, 383, 393
dust grains in atmospheres of, 265, 267–70, 272–73, 275, 277, 280, 283, 447
dwarf, 446–47, 450, 455–56, 461
early-type, 219, 441, 447–48
effective temperatures of, 118–21, 124–32, 136–41, 144, 150–51, 156, 158–59
ejection of matter from, 8–11, 268, 271, 274, 277, 279, 281, 283, 400, 416, 429–30
evolution of, 1, 7, 10, 12, 263, 281
flare, 6–7, 12, 450
flares in, 447, 476–79, 481–82
formation of, 1, 7, 10, 12, 77–78, 251–52, 280, 380, 382–83, 549–550
giant, 142–43, 159–60, 430, 441–42, 444, 447, 456, 461, 472, 474
halo population, 366–67, 383, 393
high-velocity, 296
inner atmospheres of, 442–43
late-type
see Late-type stars
long-period variable, 269, 271, 281–82
luminosities of, 117, 119–20, 124–33, 136–37, 139–44, 149–53, 145–60, 439, 450, 459, 462–63, 480
M dwarf, 117, 146, 152, 264, 269–71, 274, 276–79, 282–84, 365, 368, 446, 450–51, 456–57, 476
magnetic, 296
magnetic fields in, 275–76
main-sequence, 34, 117–24, 133, 149, 153, 159, 380, 442, 445–46, 448, 450, 455–58, 461, 472, 475–76, 480, 483
masses of, 115–60, 429
determination of, 116, 122, 124, 134–35, 143–44, 149, 153, 155, 159
mass loss from, 244, 263, 265–66, 268, 270–73, 277–82, 400, 406, 416, 418, 427, 435, 474
metal-poor, 399, 429–30, 434
metal-rich, 399
Mira-type, 264, 268, 272, 276, 278–79, 281–84
moving groups of, 115
multiple, 283–84
nucleosynthesis in, 266, 399–400, 412–13, 416, 419–21, 427–35
explosive, 427, 433–34
OB, 78
outer atmospheres of, 442–43
oxygen-rich, 264–65, 268, 272, 274, 280–81
parallaxes of, 115, 121, 142, 145–54, 160
photometry of, 116–17, 122–25, 133–35, 140, 142, 148–49, 158–59
photospheres of, 263–65, 268–70, 272–73, 276, 284, 441–44, 447–48, 455, 458, 460
Population I, 120, 381, 416, 418
Population II, 416
pre-supernova, 282, 418–19, 426, 433
pulsation of, 269, 271, 278, 281
quiet-chromosphere, 461
radiation pressure in, 270–71, 274, 278, 279–80
radii of, 120–44, 149–53, 155–60
reddening in spectra of, 135, 138
red-giant, 18
rotation of, 275, 279, 439, 455, 477–78
RS CVn, 140, 447, 450, 456–57, 460–61, 476–79
S-type, 264, 282
semiregular red variables, 271
speckle observations of, 142–44, 147
spectra of, 439–78, 480–83
width-luminosity relation in, 462–64, 466, 469–70
see also Chromospheres of Stars
spectral type of, 117–19, 121–22, 124–33, 136–41, 144–56, 158, 160
spectroscopic observations of, 116–17, 121–23, 125, 133–35, 140, 142–45, 155, 160
subdwarf, 364, 373–74, 381, 383–84
subgiant, 120, 140, 155
supergiant, 142, 441, 444, 446–47, 457, 466, 468–70, 474–75
surface gravity of, 120, 124, 439, 447, 458–60, 464–66, 468, 483
symbiotic, 283–84
transition region in, 443–46, 448–49, 457–58, 462, 473, 477–78
T Tauri
see T Tauri stars
turnoff masses of, 365
ultraviolet excess in, 125
visual flux of, 120–21, 133, 148, 152–53, 159
visual observations of, 115–16, 122–23, 132, 143, 145–46, 148, 159
white dwarf
see White dwarf stars
W Ursae Majoris, 115, 138
Stellar winds, 219, 243, 252, 296
Stokes parameter, 338, 530–31
Sun
chromosphere of, 439, 445, 448, 451–53, 455–56, 458, 462, 470–71, 477–78
color index of, 117
formation of, 77–78, 105
ultraviolet radiation from, 88–89
Sunspots, 480
Supermassive objects, 193, 351, 427
Supernovae, 221, 234, 252, 281–82, 377, 400, 406, 416, 419, 427, 429–30, 434

Supernova remnants, 220–21, 225, 229, 231–35, 238–43, 250, 254–55, 267, 280, 400, 416, 418, 427, 503
Suprathermal particles, 255–57
Synchrotron emission, 177, 182, 185–87, 193, 202–3, 205, 225, 312–13, 332, 344, 346–50, 352, 503, 533

T

Terrestrial planets
  formation of, 77, 79–80, 83–91, 94–98, 100–10
  collisions in, 85–95, 100, 103–105, 107, 110
  eccentricities of orbits in, 79, 90–91, 94, 97, 100–1, 109
  gas drag in, 85, 87, 103, 106–7, 109–10
  gas phase in, 77, 88–89, 106, 110
  gravitational instability in, 77, 80–85, 88–89, 110
  heat sources in, 79, 105
  inclinations of orbits in, 79, 91–92, 94, 100–1, 109
  intersection of orbits in, 107–9
  jet streams in, 104
  orbital angular momentum in, 80, 82
  rotational instability in, 85
  spin angular momentum in, 80, 85
  sticking in, 85–87, 101, 107
  sweeping-up in, 86
  time scale of, 83, 96, 99, 100, 104–6, 108–9
  turbulence in, 83–84
  primordial atmospheres of, 109–10
Tethys, 66–67, 70
Thermal conduction, 223, 225, 227, 229, 297
Thermal instability, 253–54
Thomson scattering, 542, 550, 556
Tidal disruption, 82, 105
Titan
  infrared observations of, 44, 46, 61–65, 67.
Triton, 44, 61
T Tauri, 242–43, 450
T Tauri stars, 9, 12, 240, 242, 252, 447, 457, 476
T Tauri wind, 88
TU Cassiopeae, 16, 28–29
Turbulence
  interstellar, 296–99, 302–3
Twenty-one-centimeter emission, 313
Tycho's supernova remnant, 229, 233, 257

U

Uhuru satellite, 343
Universe
  energy density in, 538–41
  evolution of, 7–8, 537–40
  mass density in, 538–41
  models of, 8, 540
  nuclear reactions in, 540
  perturbations in, 537–38, 545, 548, 555
  recombination in, 541–42
  temperature of, 538, 540–59
  X-ray observations of, 538, 550, 553–54
U Ophiuchi, 134–35, 138
Uranus
  infrared observations of, 43–44, 46, 61–65
UV Ceti stars, 447
UX Arietis, 477–79

V

V 1016 Cygni, 282–84
V 367 Scuti, 16, 28, 35–36
Vega, 120, 447–48
Vela X, 234, 241–42, 258
Venus
  formation of, 88, 101, 104–5
VLA, 167, 172, 199, 201, 212
VLBI observations, 168, 195, 212, 276–77, 284, 329, 332, 334–35, 342, 347, 349, 351, 355
Volatiles in solar system, 45, 67, 81, 110
Voyager spacecraft, 67, 73
VX Sagittarii, 270, 274–75
VY Canis Majoris, 274–75, 277

W

Waves
  damping of, 293–95, 297, 301
Westerbork telescope, 167, 171, 173, 175, 191, 198, 210
White dwarf stars, 153, 160, 284, 363–94
  absolute magnitudes of, 365, 367, 380, 390–94
  accretion of interstellar matter by, 374, 384, 386–90, 393
  ages of, 367
  atmospheric opacities of, 373, 375, 390–91
  Balmer lines in spectra of, 365–66, 369–72, 375, 377
  in binary systems, 365, 367, 374, 379, 393–94
  birthrate of, 380, 382, 384, 391, 393
  black degenerate, 394
  Chandrasekhar mass limit in, 363, 381
  in clusters, 365
  colors of, 364–67, 369, 373–75, 377, 380, 393
  composition of, 366, 368, 370–78, 381, 387–88, 390
  convection in, 370, 373–75, 385–91
  cooling of, 371, 379–80, 389–91, 393–94
  coronae of, 368, 384, 386–87, 389–90
  Coulomb effects in, 391
  crystallization in cores of, 391, 393
  DA-type, 365–73, 377–78, 381, 383–85, 387–88
  densities of, 363, 373
  diffusion in, 373, 384–85, 393
  discovery of, 364
  distances of, 367, 369
  dredging of matter in, 387–88, 390
  EUV radiation from, 367, 371, 373, 386
  evolution of, 374, 379–82, 384–85, 388
    in close binary systems, 365, 374, 381
  gravitational redshift in, 370–71
  helium-atmosphere, 365, 368, 372–75, 384, 386–88
  helium cores in, 381
  helium-rich, 366, 376, 379, 384–86, 389
  hydrogen-atmosphere, 369, 372, 375, 377, 379
  line profiles in spectra of, 367, 375, 377
  luminosities of, 363, 365, 367, 380, 390–94
  luminosity function of, 365, 390–94
  magnetic fields in, 379–80, 383, 389

mass distribution of, 371
masses of, 364–65, 367–68, 370–71, 374, 379, 381–84, 389, 394
mass loss from, 381–83, 385–87, 389
mass-luminosity relation for, 363
mass-radius relation for, 368, 381
model atmospheres of, 369–75, 377, 384, 386, 391
numbers of, 367
parallaxes of, 364–65, 367, 369, 393
precursors of, 374, 379, 383
progenitors of, 380–83
  mass limit for, 382–83
proper motions of, 364, 392–93
radiative acceleration in, 384–86, 390
radii of, 363–64, 367–68, 371, 374
rotation of, 296, 377, 379, 381, 389
spectra of, 364–73, 378–79, 384, 388, 392
stellar winds in formation of, 381–82, 384
surface gravities of, 363, 367–68, 370, 372–75, 378, 384, 390
surface temperatures of, 364, 366–68, 371–76, 378–80, 384–88, 390, 393
thermal bremsstrahlung in, 387
ultraviolet flux from, 367–69, 371, 373, 376, 384, 386, 389–90
variability of, 377–79
velocities of, 365–67, 370, 379, 388–89
X-ray emission from, 365, 367, 371, 384, 386–87
Wien spectrum, 273, 490, 541, 549–550
Wilson-Bappu relation, 439, 462–63
Wolf-Rayet stars, 445
W Ursae Majoris, 115, 138

XYZ

X-ray emission, 115, 221, 229–34, 241, 294, 365, 367, 371, 384, 386–87
Zeeman effect, 499, 517
Zeta Herculis, 148–49, 152
ZZ Ceti stars, 377–79, 387

RADIO SOURCES

1400+162, 334, 338, 342, 354
3C 31, 172, 198, 202–5
3C 47, 179–80, 188
3C 83.1B, 173, 175, 190–191, 201, 204–5, 209
3C 129, 173, 190, 198, 201–2
3C 219, 188, 198, 202, 204
3C 236, 168, 179–80, 194–96
3C 273, 167, 172, 195, 198, 346
3C 279, 334, 338, 340–42, 346, 353
3C 345, 334–35, 338–42, 346, 353
3C 371, 331, 338, 342–43, 354–44
3C 390.3, 329, 331, 334–36, 338, 342, 354
3C 446, 338, 340–42, 346
3C 449, 172–173, 179, 192, 198–99, 201–2, 204
3C 454.3, 338, 340–42, 346
3C 465, 174, 176, 188, 198, 209